

FIGURE 1A

Nucleotide sequence of the partial PK-6 from *Physcomitrella patens* (SEQ ID NO:1)

GCACGAGCTCAATCCTCATGTTTCGGACTGTGGACTAGCTGCCCTTGCACCATCTGG
TTCTGAACGCCAGGTGTCGGCACAAATGTTGGGCTCTTTCGGTTACAGTGCCCCTGA
GTACGCCATGTCTGGAACCTATACCGTGAAGAGTGACGTCTACAGCTTCGGTGTTGT
AATGCTGGAGCTACTCACTGGGCGCAAGCCTTTAGACAGCTCAAGACCACGATCCG
AGCAATCTTTGGTACGATGGGCCACACCTCAATTGCACGACATCGACGCCCTTGCAC
GAATGGTGGATCCGTCGTTGAAGGGCATCTACCCTGCTAAATCACTCTCTCGGTTTG
CTGATATAGTCGCCCTTTGCGTCCAGCCGGAGCCCGAGTTCCGACCCCCGATGTCTG
AAGTGGTGCAGGCACTTGTAAGGCTGATGCAGCGTGCGAGTCTGAGCAAACGCAGA
TCGGAGTCCGCTGTTGGGAATTGAGTCGAACGAGCCATCTGAGACTTCACCTTTGAG
AGTACTGAAGCGCCCACTAGCCTAATCGTGCATCTTTGGCCATCTCGTTTCTGAGTG
GAACACAAAGCTGGGTATATTCTTTGGTGGTTAAGCAACCATTTGTCCCAATTTGAA
CTTCCGCTGGNGAAGGTCTGTATGTTGAGAAACGATGCAAAGCGTTCGCGTGGTNTG
CTTGAACCTTCAAA

[illegible]

GGCACGAGCCGAACCTTCAGCAGCTTCTTCACATCTTCAGGTTGCTTGGCACCCCGAA
TGAGACAATCTGGCCTGGTGTAGCCAGCACCGTGATTGGCACGAGTTTCCTCAATG
GAGACCACAAGATCTGTCCCTTGCTGTTCCCGGACTCAGCGCGGTTGGCTTAGACCT
TCTCGCCAAAATGTTGGTATTCGAGCCCTCAAAGAGAATCTCTGCCAAAGCCGCCTT
GAGCCATACTTATTTGCTGATGTTGATAAGACAGCAACCTAAACACAACAGAACA
ATTCAAGAGAACCAGGTAACCTCTACCTGTCCAAGACGAAGGACATCTAACTCTTCA
GTCAAACCTTGGCCAATCATGCTGATTGGGAATTGAACCACAGGAACGAGGTGGGCA
CCGTGGTTCGCTGTAGCATACAAAGTAGTCTGGAAGACTTGACATCGTTAGCTGGCA
ATGCAGTATTTTGGAAATACAATTTTTCATTAAAAATCTCCTAAAGATTCAATATTTG

FIGURE 1C

Nucleotide sequence of the partial PK-8 from *Physcomitrella patens* (SEQ ID NO:3)

GCACCAGACTATGACAAGCGCACGCCCTTGACATCGCCGCGTCCCTGGATTGTGTC
CCTGTTGCTAAAGTCCTGCTTGCGGAAGGAGCAGAGTTGAATGCAAAAGACAGGTG
GGGGAAATCTCCGAGAGGCGAGGCGGAGAGTGCAGGATACATGGAGATGGTAAAG
CTGTTGAAGGATTACGGGGCTGAGTCACACGCAGGTGCCCCGAGGGGCCACGTTGA
GAGTCTGATTACAGGTTGCCCTCCGTTGCCTTCTAACCGCGACTGGGAGATCGCTCC
GTCGGAGATTGAACTTGATAACCAGCGAGCTCATCGGCAAAGGCTCCTTTGGAGAGA
TTCGGAAGGCGCTTTGGCGCGGCACACCCGTCGCTGTGAAGACAATCAGACCTTCTC
TGTCCAACGACAGAATGGTCATCAAGGACTTCCAGCACGAGGTGCAATTGCTCGTA
AAGGTTTCGGCACCCAAACATTGTGCAGTTCCTCGGGGCTGTTACCCGTCAAAGACCT
CTCATGTTAGTCACCGAGTTTCTGGCAGGGGGGCGATTTGCATCAGTTGCTGAGGAG
CACCTAAATTTGGCTCCTGACCGCATCGTGAAGTATGCCCTCNACATAGCTCGCGG
CATGTCTTACTTCACCATCGGAGCAGCCCA

FIGURE 1D

Nucleotide sequence of the partial PK-9 from *Physcomitrella patens* (SEQ ID NO:4)

TCCAGCCCATTGTTGGCCACACACAGCTGTTTCATGAGTCACCCGCTTCAGGNTGA
ACTGAAGAAACGTAACCTCCGTACGGCTATTTTACCAAATTTTCAAGCTCGTTGTCCC
GCCATGATCCAAATGGAAGCTCAGTTTGCAACATGAAGTACATTGAACACACCTACC
GCCCACCAGTCAGAAGCCAGGCCATGACCTTGTCCTTGAATGATCTCGGGTGCTAAG
AAATCAGCCATGCCACAGACTGTGAAAGTGCGCTCATCCGACATTTGCTTTGCAAAC
CGAAAATCAACCAGCTGAAGTCGTCCTTTCCGATCTATCATAAGAACATCGGGAGA
GATGCCACGATATACAACGCCATCCTTGTGCAGAAGTTCGACGGCTAATACCACGTT
GGCGACCAGAAAACGAGCTGAGTTCTCGTCTAAAGGTGACCGAAGTAGAAGTTCTA
GAGGCCCAGCTAACACACAATTAAGAACGAGTGCCACATTGTCACTGTCAATAGGG
GTGGCCAAGAGATGCGGCACGAATGGGGAAGGCCTCAGTTGCTTGAAAAGAGTTCT
CTCCAATAGGACTTGGCCCTCCCGACCGAGTCTCTGAACTTTACGTCTCTGGTACCTT
TTCATGCTTATGACGTCATCTGATTTCTTGCAGAGCACCACACCGACATCACAGCAA
TCGGTTGAATAGACCTGGTGCCGATTCT

FIGURE 1E

Nucleotide sequence of the partial CK-1 from *Physcomitrella patens* (SEQ ID NO:5)

TATGCCCATCTTCTCATACTCAGACCAGATCCTCTATTTCAATTACAGAAGAAAGTT
GCTTGTGCAACGTATTGAAATCATCACCGTCATGGGCTTTCCGAGTAAAAATTCTTG
TAATGGATAAAGTCATTTCTAGTCTGATCCATACAAGCTACCGACACAATGCTAGAA
GCCTTGATTTACACACTACACACTAGAGAGTCTACAACCTCTTTTCCTACACTCTGCTT
AGTTGCCTCATCCTCAACTCCATAAACCCCCATTACAAATCATGTAAGACTTGAGAG
AGGGAAACAGTAAGCAACCTTGTGCTATTTTAGTACCAGAGCAGAGGATGAACCAC
TAGTCCTCCCAACGTAAGCCCTAATTCGCCGCAACAACCTCACGACGGAACCTCCGAC
TTGGTCAAGGGTGGACAATATGATACATTCGAAGGTCGATTTTGCAAATGGGACGA
AGCAGCGGAATTCTGGCTGCGCACTGATTGCAGAGAGCCATTCTGGGGGAGTTGAG
TATACACAGTCCAGTCGTACACATGGTCGAGCTGGAATTTTTCTGAATGAAAAGAT
CACGGAACAAGCTTCGGAGGTACAGTAGTCAGGCTGCTCGTAAAAACCTANACTTC
GCGGCGTGGTGCAAAAAGTCGGCAAATTGACTGGGATACCCATCACAAAGCTCCTC
CCACAGTGGGGGTCATCTTGATTTTGTTGTGTCATGTACTCGTGTTGCTTCTGGTCAGT
GAGGGCGTTGCCCGCCCTTCCCTTGCCATGGCAAATTGCCTCTTAGAAAGTACATAA
GAATGTAACCCAAGTGATTCTATGTCATCTCTTCTACTGTGCTCGATTCCCTCTGTGCT
GATTCCTACTAGCGTACCGTGCCGTCCCTGTGAAGCTCTTCCTATCTCGGTAAGGGA
TATGCCTTCGTGTTGCCGGGTCCATGTACTCCTTTGCCAAGCCAAAATCTATAATGA
ACACTTGGTTTTCCTTGCCGACCGCAGCCCATGAGGAAGTTATCCGGCTTCAGGTCAC
GGTGAACGAGCCCTCGAGAATGCACGTATTCCACCCGGTCAATCATTTGGTAACCGA
GCATAATCACGGTCTTCAACGAAAACCTTAGCCACACACCTTAAAGAGGTGCAAC
AGGTTTCGGCCCCAATAGGTCTAGCACCATCACATTGTAGTCTTCTGCTGCTTTTCCGA

FIGURE 1E Continued

ACCATCTCATGTTGGGCACTCCCTTCCCACCCGCAATATGTTGTACAAGCGCGACT
CGTGCATTAACTCTCGTGC

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2
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FIGURE 1F

Nucleotide sequence of the partial CK-2 from *Physcomitrella patens* (SEQ ID NO:6)

TTTTTTTTTCCAATAGATTTCATTACATAACTCCAAGTTATGATATGTACAGGTTA
GCAACAAGCTAATGGCTGCAAGCAGTGAACATACTACCAAGGGAGAGATTCTCACT
CCCTAGACTTCATCCTCGTACGTTACTTGGCAAGGATTATGGTTTAGTGATAAAAAG
CTTCACAAGCCGGCAAGCATGCTGGTTGCTTCTGCTGCAATCTAATGATTATTCCTT
AGGAATCGTATGGCAGAGAGCTACCACACAAAGCACTGACAATGGTTTGATGGTAA
CAAGATAGAGATCCATTCATTCCTAAGTATGAGAGACCTGTAGTCTTAGCACCATTG
TAGGACAGAACCACCGTTTTCCCCTCAATCAGGCTGTTGCCAAATGTAGAGCAACTC
TCATCAACATAACAAGAGGGTTTGATAGAAGACAGAGCCCGGCTATATAACCACAA
GCCCTGCGCCTACCTTATAACGGCTTGGATCCACCTCAACAGAAAGTGATTCAACTC
CCTTGATACCGGCTTTCGTAAATCCTCAAGTTGGCAGATGGCGGTTGTGGATGGCGG
CTAGATATCCGCTTTGGGTCCGAAGTAACTGGAGAGCTCCTCTGCATCCCTGCTGAC
GACCGTAAGCTGGTGGGACCAAGCTTACTGCTCCCTGTTCGAGAGGAATCTACGACT
TCTGCTGATGCCCCTGAGGGCCTGCTGCTAGATAGGACAGCTCGCCTGGAGGAAGA
ACCCCCCGAGTTGCATACGAAGATGTATGCATGCGCTCTGGTTCTGACACAACAGC
AAGAGCAGAATCCTTAGCAGATTCATCAAGTCCAGGACTTTTGTGCTTAGATGAGTC
CAAAGCATTTGCGACCCCGGAGCCATTTGCTCCTCCAGGAAGCCTGCGCCGAGAAG
GATCCATTGGTTCGGTGGGCCGCTGCAGGTCTCGGCTTCCTGTAGCCCCAGTTCCAA
GTGCACCACTGGTTTGCCCTGCAGAAGCACCCAGTCGAGTTGAACTGCCACCGGAA
ATTTGTGACTGCTGGTACTTCAGAATTGTCCAGTCAAAAACGTAGTCAAATTGAAAA
CCTGTAAAACTATTTCCAGTTTAGGCAAACAGAAGTGGCACTGTAATAAACTGAAA
ATCATCAAACATTCACAAACTATCTGTTTCGTTGATAGAGCATAGTAAAGTCTGCGCT

FIGURE 1F Continued

TAGGATCAAGTCTTGATACATTACAATGCCCAAGCAAGAGTGAAACCTACAAAAGT
TACAGTTTTTCATACCCTCACGAATAAAGAGGTCACGGAAGATTCTTTTCAAATATGC
ATAGTCGGGTTTGTTCATCAAAACGCAAGGACCGGCAGTAGTGGAAGTACGCTCGTG
CGAATTCTGAAGGATAATTTTTACAAAGGACCTCAATGGGCGTGGACATTTGTTTTTC
TCACTGATCTTCTCGTACTTCTGCTTCTTGGTTCCCGCTTTCAGTCCTTGCCCATGGAA
GACTGCCTCTCAGGAAGTACATGAGCACATATCCAAGAGATTCCAAATCATCTCGTC
TGCTTTGCTCAATACCAAGATGAGTGTTGATGCTTGCATACCGAGCAGTCCCTGTCA
GATTTTTGTTCTCCCTGTAGGGAATATGCTGATGCGTGGAAGGGTCGCGGTACTTCTT
GGCAAGACCAAAATCAATAATGTAGACCTGGTTTGCTCGCCTACCAAGCCCCATTAG
AAAATTATCAGGCTTGATGTCTCTATGAAGAAAGCTTTTCGCATGCACATACTCCAC
TCTGTTGATCAGCTGGTCAGCAAGCATGAGAACAGTCTTTAAAGAGAACTTCCGGCT
GCAGAAGTTGAAAAGGTCTTCGAGACTTGGCCCCAACAGATCCAGAACCAAGACAT
TGTAGTCTCCTTCTATCCCGAACCATCCTCGTGC

FIGURE 1G

Nucleotide sequence of the partial CK-3 from *Physcomitrella patens* (SEQ ID NO:7)

CGGTGGGGCGCTCCCCAATATTTTATCCCCGGGGCTGCAGGGAATCCGGCGACCAGT
NTTTGAAGGTGTCAACGCCGTGAATAGTGAGCGTTGCGTTATGAAGATTTTGAAGCC
AGTAAAGAAAAAAAAGATCAAAAGAGAGATCAAGATTCTGCAAAACCTTTGTGGAG
GGCCCAACATTGTGAAGCTTCTGGACATTGTCCGTGATCAGCAATCGAAGACACCCA
GCCTAATTTTTGAGTATGTGAACAATACTGATTTCAAAGTGCTCTACCCCACTCTTAC
AGACTTTGATATCCGATACTACATTCATGAGCTGCTCAAGGCTTTGGACTATTGCCA
TTCTCAAGGGATTATGCACAGGGATGTGAAGCCACACAACGTGATGATTGACCATG
AGCAGCGGAAGCTTAGGCTTATTGACTGGGGACTTGCCGAATTCTATCATCCTGGCA
AAGAGTATAATGTGCGTGTTGCCTCTAGGTACTTCAAGGGTCCTGAGCTGCTGGTTG
ATCTTCAAGATTATGATTACTCTCTCGACATGTGGAGCTCTGGGGTGCATGTTTGCCG
GCATGATATTTTCGGAAGGAGCCATTCTTTTATGGGCATGACANTTCATGATCAACTT
GGTGAAGATCGCTAAGGTGTTGGGAACTTGATGAATTGAATTCCTATCTAACAAATA
CCGCTAAGTGGACCCCATTTGGAGCACCTGGTGGGGG

FIGURE 1H

Nucleotide sequence of the partial MPK-2 from *Physcomitrella patens* (SEQ ID NO:8)

GCACGAGGAACTAACGAATTGTCATTCTATAATCCAATAGTGTAATCACACGGGGG
GGAATAAGTTGCAAAACCATAACAACGCCGGGATAGCGTTGTAGCCACCTAAAGAAT
TGAGAGTAGGCCTTACAACCTTGAGATGAAGTGTGAAGTGGTACTGCACCATATCATC
AGGACCTAAGCTGCAATCCAGAGCCTCCCTCCAAATGAGATCCCTGATAGGCTCCTC
CGAGATAGAGGGCTCCTCGAAGCCAACTCGAAGGGAGATACCGAGCCAGGCTCAT
CGTTGATGTCATGAAGTGAAGCTTAAATAAGGGTGCGCCAAGGCAGCTTCCACTGTG
ATTCTTTTCGCTGGATCAAAGACCAGCATCTTTTCAACAAGATCAAGAGCAGAACGA
TTAATGCCTCTGAACTTCTGGGTAAAGGGAATAGGCGACTGTCGAGGCAGGTGCTTG
ATATACCGCCTAGCATTGTCGCTTCTCAAAAACCCAAGATCCCTATCTTCAGGAGTT
CCGATGAGTTCTGTAATTAGGCGGAGCTGATGCACATAGTCTCTCCAGGGAACAAC
GCAGATCGGTAAAGCAACTCCATGAAGATGCACCCACAGACCAAATGTCAATAGC
TGCAGTGTATGCTGAACAATTCAGGAGCAGCTCTGGAGCTCTGTACCACCTCGTTAC
AACATACTCAGTCATGAAATCCGTTTCAGAGAGAGTGCGTGCCAAGCCAAAATCTG
CGATTTTCAAATCGCAATTGGCATTGACGAGAAGGTTGGTGGGCTTCAAGTCCCGGT
GCAAGACGTTGCGCGAATGGATGTACTTCAAGCCCCGCAAGATTTGATACAGAAAA
TACTGACAGTGGTCTTCTGTGAGAGCTTGATTTGAACGAATGATCTGGTGTAGGTCC
GTATCCATCAACTCGTATACAATGTACACGTCGTTGAAATCTCGTGC

FIGURE 11

Nucleotide sequence of the partial MPK-3 from *Physcomitrella patens* (SEQ ID NO:9)

CGGCACCAGCCTCGCTGGAGACCGACCATCGAAGCACCTTAAGCTCGTTTTTCATTTCG
GCATTGCTTGCGAGCACTTCGACTTCCTAGAATTTCAATAGACCTAATGGAATCGCC
ACTCCCTAATCTTTCCGGAGAGGCCTTATCGCCGACGGCAACTGCCGAAGACGAGAT
TACTCAGATGATACTAAAAAGTGCCGCAAGGTCCGAATTAGGAATGTATGTTTCGAA
GAGACAGGAATTCTATCTTCGAAGAGCGCGGAGGCGGCGTAAGTTTGCGTGGAAGC
CGGTTTTGCAGAGCATCTCCGAGATGAAGCCTGTCATGGAATTCCACACTCCGATGG
CTTACCGGGATAGTGGGTCTCCGCCGAAGAACGCCTCTACCCCATCCTTACCTGGCC
CGAAGAACATTTACCGCCACGACAAGTGAGTGTCCCGCAAAGGAGCAGTCCTCCG
CCGAAGAACGTCTCACCACCTCCCCAGCCCGGCATTTTGTAGCGCGGACTGCGATCG
AAGTATTCTGCTGCATCTCAGCAAGTTCAACGAAATCGAGGGCAACGCGAAATCTCT
TTTATATGGCGTAGTTTGTGTCTCCGACTGGACTCCTATCTATCCCCATCGAGATAAC
TGATTCCGGTGGATAATTTCTCCAAATTTTGGCTAACNCAAGAANCTCAAGGGCGAAT

FIGURE 1J

Nucleotide sequence of the partial MPK-4 from *Physcomitrella patens* (SEQ ID NO:10)

GCACGAGGTTGGTGTAAAGTTATTGATAGTGCTGTGCAATTCACAGTTTTTGCTACTCC
GGTAGGTCCGACCTCTTCAATTGTCAGTTTAAAACTCTAAAAACATTTGAGAAAAG
TGTTGAAAAATCTCCGTGAGGAAATTCCTTGTCGCAAGACGTGAAAAAAGAAGAA
AGAAGATGGAAATATTGTTTTGGGTATCGAAGAAGTGTTTCGATGCTGTGCAATAAG
GAAAGAAAAAGTGCAGGTAACATAAAAAGCTAGCATGGTGATGATAATATAAGACC
CCGATTAACACACTTATGGATTGTTTCATGAGCTGCACGTTCTCAGCGACAAATGGG
GCTCATTGAGAAAACCTCACTTTCTATAAGGTTGGGAAACGAGCGTTTTTTTTTTGA
AGATGTTTTTTCCGTCAATCTGATTTGATATCGTTCTCAACTTGACCACATATGACTA
TATAAGGAAAAGGCATTGAGAAAGTGGCGGATTGGCGAGGTAGTTCGACCATGCTT
TTGGTAAAGTCCCTTGAAGTTCAGTGGTGGATCAGGCTTGTGGTAGTGACAGTCTCT
GCACGCCATGCGAGGCTAACTTTAAGTTACAAAATCTTGCTCAAATGGTACTCTTCC
TCGTTGTACTTTTTGCAGGAACGGATGTTTAAAGTAAATCAGTAGTTGATGGTCGTTCA
CTGGGACATTTCCGGATGCAGGATTCAATAAAAGAACAAAATTCGGGGGAGAATTT
GTCAGGGGATGCGGCTGCGGGGGGTTGATTAACATAACATTCCATGAGGATGAAGA
AATTTTGCCAACCCTCTTCCATTCCAGCTGGTTTGTATGGGAAGGTACCCAACGCAC
ACTCCAAAAGAGTCAATCCTAAACTCCATAGGTCACTGTCGTATGCATACGAACGCC
CCTGAAGGCGTTCTGNCGACATATATGTGCAAGTCCCAACGAACGTGTCTCGCTGGG
CCAAGGAATGAACCAACACAGCACTGACACCAAAATCAGATATTTTGACCTCACCC
TTGTGATTGATGAGGAGGTTGGAGGGCTTTATATCACGATGTATGATGTGCCTGACT
TGGTGTAGGTATTCCAATCCCTTCAGAACTTGACTAGCAATGACGGCCAAATACGGC
TCAGGTATNTGCTTTCTGGTGC

FIGURE 1K

Nucleotide sequence of the partial MPK-5 from *Physcomitrella patens* (SEQ ID NO:11)

TCCCCGGGCTGAGGAATTCGGCACGAGCGGTTGATCCTCACCTTGGAAGGACCCCT
GGAATTGAGTAGCGTGCGGAAGCTGCATCGATCCGGAAGAGACGATGAGTAGGAGA
GTGAGAAGGGGAGGTCTTCGCGTCGCGGTGCCGAAGCAAGAGACTCCCGTCAGCAA
ATTTTGTACTGCCAGTGGAACCTTCCAGGATGATGATATCAAGCTCAACCACACCGG
GCTTCGCGTCGTCTCTTCAGAACCTAACCTTCCTACGCAGACGCAGTCTAGCTCCCC
AGATGGGCAACTGTCAATAGCAGACCTGGAGTTAGTGCGGTTCTTAGGAAAGGGTG
CGGGTGGAACCGGTGCAGCTTGGTCCGGCACAAATGGACCAATGTCAATTATGCAC
TGAAGGCGATACAAATGAATATCAACGAAACAGTGAGGAAGCAGATTGTTTCAGGAG
CTGAAAATCAACCAAGTGACGCACCAGCAGTGCCCTTATATCGTGGAATGCTTCCAC
TCCTTCTACCACAACGGCGTCATATCCATGATCCTAGAGTACATGGACAGGGGCTCG
TTGTCCGACATTATTAAGCAACAAAAGCAGATACCTGAGCCGTATTTGGCCGTCATT
GCTAGTC

FIGURE 1L

Nucleotide sequence of the partial CPK-1 from *Physcomitrella patens* (SEQ ID NO:12)

GCACCAGCCGAGTCGGGCATTTTTTCGTGCGGTGTTGAGGGCTGACCCGAGCTTTGAA
GAAGCCCCTTGGCCTTCCATCTCTCCCGAAGCCAAGGATTTCGTGAAGCGTCTCCTG
AATAAGGATATGCGGAAACGCATGACTGCTGCACAAGCTTTAACTCATCCATGGATT
CGAAGTAACAACGTGAAGATACCTCTGGATATCTTAGTGTACAGACTTGTGAGGAAT
TATCTTCGTGCATCATCCATGAGAAAGGCTGCTTTGAAGGCCCTGTCAAAGACTTTA
ACCGAAGACGAGACTTTTTATCTACGTACTCAATTTATGCTGCTAGAACCAAGTAAC
AACGGTCGTGTTACTTTTGAGAATTTTCAGACAGGCACTGCTGAAAAATTCAACAGAG
GCCATGAAAGAGTCACGGGTTTTTTGAAATTCTGGAATCGATGGATGGTCTTCATTTTC
GCACCAGCCGAGTCGGGCATTTTTTCGTGCGGTGTTGAGGGCTGACCCGAGCTTTGAA
GAAGCCCCTTGGCCTTCCATCTCTCCCGAAGCCAAGGATTTCGTGAAGCGTCTCCTG
AATAAGGATATGCGGAAACGCATGACTGCTGCACAAGCTTTAACTCATCCATGGATT
CGAAGTAACAACGTGAAGATACCTCTGGATATCTTAGTGTACAGACTTGTGAGGAAT
TATCTTCGTGCATCATCCATGAGAAAGGCTGCTTTGAAGGCCCTGTCAAAGACTTTA
ACCGAAGACGAGACTTTTTATCTACGTACTCAATTTATGCTGCTAGAACCAAGTAAC
AACGGTCGTGTTACTTTTGAGAATTTTCAGACAGGCACTGCTGAAAAATTCAACAGAG
GCCATGAAAGAGTCACGGGTTTTTTGAAATTCTGGAATCGATGGATGGTCTTCATTTTC
AAGAAAATGGACTTTTCAGAGTTCTGTGCAGCGGCCATTAGTGTTCTCCAGTTAGAA
G

FIGURE 1M

Nucleotide sequence of the partial CPK-2 from *Physcomitrella patens* (SEQ ID NO:13)

GCACGAGCTCCTGCATCTCCCCCTCCTTCTCCTCCTCATCATTCTGGAGCCCAGCGAA
CTGCGATCTGAGATTCCAACCTTGGAAGGGCCTCGCGTAAGCACCGGAGCTCGTTTCT
TACGCTTTTGCGCCTCGCGATATTTGTACATTGTTTCCTCTGGTTTTATTGATTCCGC
CTCTGAAAATGTGAACGGGCTGCAAGCTTGGTTTTGGAGCAACGTTGGAGCATTGAA
GGGTTGCGCTCGTCCCTGCCCATTCTCGCTTCTGCTCTGGCCTATGTCATGACGACG
TGAAGGAGAGGATTTGAGGGTTTTGCAAGTGATATAATCCTCCCCGAGGAGATTTCT
GTGAGTTGATTAACCTTGGATCAGCGACATGGGGAACACTAGTTCGAGGGGATCGAG
GAAGTCCACTCGGCAGGTGAATCAGGGAGTCGGGTCTCAAGACACCCGAGAGAAGA
ATGATAGCGTCAATCCAAAGACGAGACAGGGTGGTAGCGTTGGCGCAAACAATAT
GGCGGAAAGCACAAGCAGTGGTGCTCAGGCCGAGAACGATCCACCTCTGCGCCCG
CTGCTCTGCCGAGGCCGAAGCCAGCATCGAGGTCAGTATCCGGTGTTTTGGGTAAGC
CGCTGTCAGATATTCGTCAATCTTACATCCTGGGACGGGAGCTTGGCCGAGGGCAGT
TCGGAGTGACTTACTTGTGTACTGACAAGATGACGAATGAGGCGTACGCGTGCAAG
AGCATCGCCAAACGGAACTGACCAGTAAGGAGGATATCGAGGATGTTAAGCGGGA
GGTTCAGATTATGCATCACCTGTCTGGGGACACCCAATATCGTGGTGTTAAAGGATGT
GTTTCGAGGACAAGCATTCCGTGCATCTTGTGATGGAGCTCTGTGCAGGTGGCGAGCT
CTTCGATCGCATCATTGCCAAGGGGCATTACAGTGAGCGCGCCGCTGCCGATATGTG
CAGAGTCATCGTCAATGTGGTGCACAGATGCCACTCATTAGGGGTCTTCCATCGGGA
TCTCAAGCCAGAGAATTTTCTGTTGGCCAGCAAGGCTGAGGATGCGCCTCTGAAGGC
CACAGACTTCGGTCTGTCAACTTTCTTTAAGCCAGGAGATGTGTTCCAGGATATTGTT
GGAAGTGCGTATTACGTGGCCCCTGAAGTTTTGAAGAGAAGTTATGGTCCTGAGCTG

FIGURE 1M Continued

ATGTTTGGAGTGCAGGCGTGATTGTGTACATTCTGCTGTGTGGTGTACCCCCCTTCTG
GGCTGAAACTGAGCAGGGTATCTTTGACGCTGTGCTCAAAGGGCACATAGACTTCG
AGAACGAGTCCATGGCCGAAAATCTCCAACGGGGCTAAGGATTTGGTGAGGAAAAT
GCTAAACCCTAACGTGAANAT

[illegible]

FIGURE 2A

Nucleotide sequence of the full-length PK-6 from *Physcomitrella patens* (SEQ ID NO:14)

ATCCCGGGTGAGTATCACTTACGGTGGCGAGGGATGGCCTTTGGGGTAGGAGCTGG
TATATGCGGAGTCCAACAGAAGCTTGTGCAGGACTCTTGAGTTGTGCGTGCGAGGGC
TGAGTGCCGGAAAGGTATTTCCGACGAAGAGTCAATGTGGGCGTGGACAAACGTT
TGAAGAGATGGGTGTGGATATGAAGGCTCCGGCTAAGCAGTCGCTGGGAGTCGGAC
TGCTCCTGTGCTCTGTAGTGATCCTCTCGGTGGTGAGCTCTGTGTATGGCCAAGTTCA
GACAGATCCAGTGGATACTACAGGCTTAATTTCCATGTGGTATGACTTAAAACAGAG
TCAATCTCTCACGGGGTGGACTCAAAATGCTTCTAACCCTTGTGGGCAGCAGTGGTA
CGGCGTTGTATGTGATGGCTCTTCTGTCACGGAAATCAAAATTGGAAGTCGGGGTTT
GAATGGAAATTTTAATCCTTCGTACTTTCAAACGCTTTTAAAAAGCTTCGAATTTTT
GATGCTAGTAACAACAACATCGAAGGAAATATTCCTCAACAGTTTCCTACGTCTCTT
ACTCAAATGATATTGAACAACAATAAATTGACCGGAGGTCTCCCACAGTTTGATCAA
TTGGGCGCCTTGACAGTCGTAAACTTGAGCAACAACAATCTGACCGGCAACATGAA
CCCCAACTATTTCAATGTGATCGTGAATGTGGAAACCTTCGATGTTTCCTATAACCA
ACTTGAAGGCACTCTTCCCGACTCCATTCTAAACCTGGCCAAGCTTCGTTTCTTGAAT
TTGCAGAACAATAAATTTAATGGTAAACTTCCCGACGATTCTCTCGGCTGAAGAAT
TTGCAGACTTTCAACATTGAGAACGATCAGTTCACGGGTAATTATCCATCAGGTTTA
CCCAGTAATAGCAGGGTTGGAGGAAATCGTCTTACATTTCCCCACCTCCAGCCCCC
GGCACACCTGCTCCCAGGACTCCTTCTCCTTCAGGAACATCGAATGGATCATCGTCG
CATCTCCCTCTAGGGGCGATCATTGGAATAGCCGCTGGTGGTGCTGTGCTGCTTTTAT
TACTAGCACTCGGCATCTGTTTGTGTTGTCGTAAGCGGTCCAAGAAAGCATTGGGCG
ATCCAGAGGCCACGACCAGCAGCCGAAGACCGTGGTTCACACCTCCCCTCTCCGCA

FIGURE 2A Continued

AAGAGCCAGAGTGATCCCAGCAAGAGCATAGACAAAACGACGAAACGCAACATCT
TTGGCAGCAGTAAGAGTGAGAAGAAAAGTTCAAAGCACAGAGTATTTGAGCCAGCT
CCTCTTGACAAAGGAGCAGCCGACGAACCAGTGGTGAAGGCGTCTCCGCCCCGTCAA
GGTACTGAAGGCTCCTCCTTCATTTAAGGGTATCAGCGGCCTGGGTGCTGGACATTC
GAAAGCAACAATTGGCAAGGTGAACAAGAGCAATATTGCAGCCACCCCATTCTCTG
TAGCGGATCTTCAGGCAGCCACAAACAGCTTCTCCCAGGATAATCTGATTGGAGAA
GGGAGCATGGGTGCGGTGTATCGTGCCGAGTTTCCCAACGGCCAGGTCTTGGCCGTG
AAGAAGATCGACAGCAGCGCGTCGATGGTGCAGAATGAGGATGACTTCTTGAGTGT
AGTAGACAGTTTGGCTCGCCTGCAGCATGCTAATACGGCTGAGCTTGTGGGTACTG
TATTGAACATGACCAACGGCTGTTGGTGTACGAGTACGTGAGTCGTGGAACCCTGAA
CGAATTGCTCCATTTCTCGGGTGAAAACACCAAGGCCCTGTCCTGGAATGTCCGCAT
TAAGATTGCTTTGGGATCCGCGCGTGCTCTGGAGTACTTGCACGAAGTCTGTGCACC
TCCCGTGGTTTACCACAACCTTCAAATCTGCCAATATTCTGCTAGACGATGAGCTCAA
TCCTCATGTTTCGGACTGTGGACTAGCTGCCCTTGCACCATCTGGTTCTGAACGCCAG
GTGTCGGCACAAATGTTGGGCTCTTTCGGTTACAGTGCCCCTGAGTACGCCATGTCT
GGAACCTATACCGTGAAGAGTGACGTCTACAGCTTCGGTGTTGTAATGCTGGAGCTA
CTCACTGGGCGCAAGTCTTTAGACAGCTCAAGACCACGATCCGAGCAATCTTTGGTA
CGATGGGCCACACCTCAATTGCACGACATCGACGCCCTTGCACGAATGGTGGATCC
GTCGTTGAAGGGCATCTACCCTGCTAAATCACTCTCTCGGTTTGCTGATATAGTCGCC
CTTTGCGTCCAGCCGGAGCCCGAGTTCCGACCCCCGATGTCTGAAGTGGTGCAGGCA
CTTGTAAGGCTGATGCAGCGTGCGAGTCTGAGCAAACGCAGATCGGAGTCCGCTGTT

FIGURE 2A Continued

GGAATTGAGTCGAACGAGCCATCTGAGACTTCACTTTGAGAGTACTGAAGCGCCCA
CTAGCCTAATCGTGCACTCTTGGCCATCTCGTTTCTGAGTGGAACACAAGCTGGGTA
TATTCTTTGGTGGTTAAGCAACATTTTGTGACAATTTGAACTTCAGCTGGAGAAGGG
TCTGTAGTGTTGAAGAAAACGAATGCAAAGCGTTTCGGCGTGGATGTGCTTTGAGAA
CTTACAAAACATCAAGACTTTGAAGATCTTTGTATTGCATCGAATCCTTTCAATCA
GTCTCGGGTAGGATCAGTTCCTCTGTATCGGATACCCTTTTCATCCTAACATGGGACC
CTTTTAATCCAGAGGATGGAGTGCTTGAATAGTGACCTTGGTCGAGTTAACGC

1000 900 800 700 600 500 400 300 200 100 0
G A A T T G A G T C G A A C G A G C C A T C T G A G A C T T C A C T T T G A G A G T A C T G A A G C G C C C A
C T A G C C T A A T C G T G C A T C T T T G G C C A T C T C G T T T C T G A G T G G A A C A C A A G C T G G G T A
T A T T C T T T G G T G G T T A A G C A A C A T T T T G T C A C A A T T T G A A C T T C A G C T G G A G A A G G G
T C T G T A G T G T T G A A G A A A C G A A T G C A A A G C G T T T C G G C G T G G A T G T G C T T T G A G A A
C T T A C A A A A C T C A T C A A G A C T T T G A A G A T C T T T G T A T T G C A T C G A A T C C T T T C A A T C A
G T C T C G G G T A G G A T C A G T T C C T C T G T A T C G G A T A C C C T T T T C A T C C T A A C A T G G G A C C
C T T T T A A T C C A G A G G A T G G A G T G C T T G G A A T A G T G A C C T T G G T C G A G T T A A C G C

FIGURE 2B

Nucleotide sequence of the full-length PK-7 from *Physcomitrella patens* (SEQ ID NO:15)

ATCCCGGGAGTGGGTGGTTGGACTGTAAGGAGCTAGCGTTTTAGAGCTACAGTGCG
GTTTGCTGTGTGAGTGAGTGAGTGAGTGAGTGCGTGAGTGAGGATGTCTGTTTCTGG
TATGGACAACTATGAGAAGCTGGAGAAGGTAGGAGAGGGGACTTACGGAAAGGTG
TATAAGGCCCGTGATAAACGCTCCGGGCAGCTGGTGGCGCTCAAGAAGACTAGGTT
GGAGATGGAGGAAGAAGGCGTCCCTTCCACCGCTTTGCGCGAAGTTTCGTTGCTACA
AATGCTCTCCACAGCATGTATATCGTCAGGCTACTTTGCGTGGAGCACGTCGAGAA
AGGCAGCAAGCCCATGCTCTACTTGGTCTTTGAATATATGGACACTGATCTTAAGAA
GTATATTGACTTGACACGGTCGTGGTCCGAGCGGGAAGCCTCTGCCTCCCAAAGTGGT
CCAGAGTTTCATGTATCAATTGTGCACAGGGCTTGCCCACTGTCATGGCCACGGAGT
AATGCACAGGGATCTGAAACCCAGAAATTTGCTCGTCGACAAGCAAACCCGTCGTC
TTAAGATTGCCGACCTTGGTCTCGGTCTGGGCATTCACAGTGCCAATGAAGAGTTACA
CACACGAGATTGTTACTCTATGGTACCGAGCTCCTGAAGTTCTTCTTGGAGCGACCC
ACTACTCTCTACCTGTGGATATCTGGTCTGTTGGGTGCATCTTCGCTGAACTCGTCCG
GAAAATGCCGCTCTTCACTGGAGACTCCGAACCTTCAGCAGCTTCTTCACATCTTCAG
GTTGCTTGGCACCCCGAATGAGACAATCTGGCCTGGTGTAGCCAGCACCGTGATTG
GCACGAGTTTCCTCAATGGAGACCACAAGATCTGTCCCTTGCTGTTCCCGGACTCAG
CGCGGTTGGCTTAGACCTTCTCGCCAAAATGTTGGTATTCGAGCCCTCAAAGAGAAT
CTCTGCCAAAGCCGCCTTGAGCCATACTTATTTGCTGATGTTGATAAGACAGCAAC
CTAAACACAACAGAACCAATTCAAGAGAACCAGGTAACCTCTACCTGTCCAAGACGA
AGGTTAACGC

FIGURE 2C

Nucleotide sequence of the full-length PK-8 from *Physcomitrella patens* (SEQ ID NO:16)

ATCCCGGGCAACGAGAAGCATTCTGAGATGGCAGATGCGAAGGAGGAAGTGGCGCTG
CGCACGGAAATGCACTGGGCTGTGAGGAGTAACGACGTGGGGCTGTTAAGGACCAT
TCTGAAGAAAGACAAGCAGCTCGTGAATGCTGCGGACTATGACAAGCGCACGCCCT
TGCACATCGCCGCGTCCCTGGATTGTGTCCCTGTTGCTAAAGTCCTGCTTGCGGAAG
GAGCAGAGTTGAATGCAAAAGACAGGTGGGGGAAATCTCCGAGAGGCGAGGCGGA
GAGTGCAGGATACATGGAGATGGTAAAGCTGTTGAAGGATTACGGGGCTGAGTCAC
ACGCAGGTGCCCCGAGGGGCCACGTTGAGAGTCTGATTCAGGTTGCCCTCCGTTGC
CTTCTAACC GCGACTGGGAGATCGCTCCGTCGGAGATTGAACTTGATAACCAGCGAGC
TCATCGGCAAAGGCGCCTTTGGAGAGATTTCGGAAGGCGCTTTGGCGCGGCACACCC
GTCGCTGTGAAGACAATCAGACCTTCTCTGTCCAACGACAGAATGGTCATCAAGGAC
TTCCAGCACGAGGTGCAATTGCTCGTAAAGGTTTCGGCACCCAAACATTGTGCAGTTC
CTCGGGGCTGTTACCCGTCAAAGACCTCTCATGTTAGTCACCGAGTTTCTGGCAGGG
GGCGATTTGCATCAGTTGCTGAGGAGCAACCCTAATTTGGCTCCTGACCGCATCGTG
AAGTATGCCCTCGACATAGCTCGCGGCATGTCTTACCTTCACAATCGGAGCAAGCCC
ATCATCCACCGCGATCTCAAACCCCGAAACATCATAGTGGACGAAGAGCATGAGCT
GAAGGTCGGCGACTTCGGACTGAGCAAGCTGATCGACGTAAAGCTTATGCATGATG
TGTACAAGATGACGGGGGGGACTGGGAGTTACAGATACATGGCGCCTGAGGTCTTC
GAACATCAACCCTACGACAAATCCGTCGACGTGTTTTCTTTGGAATGATATTATAT
GAGATGTTTGAAGGCGTCGCTCCGTTTGAGGACAAGGATGCATACGACGCTGCCAC
ACTAGTTGCTAGAGACGATAAGCGGCCAGAGATGAGAGCCCAAACGTATCCCCCAC
AAATGAAGGCATTGATCGAGGATTGCTGGTCACCGTATACCCCGAAGCGACCACCTT

[illegible]

TCGTCGAAATCGTCAAAAACTCGAGGTAATGTATGAGGATTGCTTATTGAGATTGC
CCAAAGACCGTCGTCATCTCCGCGACATCTTGCATCTTCGACGCAATCCTGCAGACT
CGTGATTGATCGGGCCAACCTTCGAGCTGATCAATCTAAGTAGTCAATGCCTTACTG
TGTCAAATTCAGCCTCCGCCGACAGATTGGCTATGGTTCAAGTGATTGGATTCTCTG
CTTCTCCAGAGCCAGAAACGACCCCCGTGCAATTTCTTCTCCGACGACCACATTGCG
ACATGAAGCACCAGACTTTGGATGTAGAAGGCATGGTCTACATGCTTTGCTGTGAGC
CTTGACGTCTCGCAGGTTGATCTCTTTAACCAGCTTCTAGCCTTTCGCAATGGCTGC
ATCACTTAAGAAATCACCGAGTATCGTGATGCTCGTTAACGC

FIGURE 2D

Nucleotide sequence of the full-length PK-9 from *Physcomitrella patens* (SEQ ID NO:17)

aTCCCGGGCTGTGATGTCGGTGTGGTGCTCTGCAAGAAATCAGATGACGTCATAAGC
ATGAAAAGGTACCAGAGACGTAAAGTTCAGAGACTCGGTTCGGGAGGGCCAAGTCCT
ATTGGAGAGAACTCTTTTCAAGCAACTGAGGCCTTCCCCATTCGTGCCGCATCTCTT
GGCCACCCCTATTGACAGTGACAATGTGGCACTCGTTCTTAATTGTGTGTTAGCTGG
GCCTCTAGAACTTCTACTTCGGTCACCTTTAGACGAGAACTCAGCTCGTTTTCTGGTC
GCCAACGTGGTATTAGCCGTCGAACTTCTGCACAAGGATGGCGTTGTATATCGTGGC
ATCTCTCCCGATGTTCTTATGATAGATCGGAAAGGACGACTTCAGCTGGTTGATTTTC
GGTTTGCAAAGCAAATGTCGGATGAGCGCACTTTCACAGTCTGTGGCATGGCTGATT
TCTTAGCACCCGAGATCATTCAAGGACAAGGTCATGGCCTGGCTTCTGACTGGTGGG
CGGTAGGTGTGTTAATGTACTTCATGTTGCAAACCTGAGCTTCCATTTGGATCATGGC
GGGACAACGAGCTTGAAATTTTTGGTAGAATAGCCCGTCGGCAGCTTACGTTTCCTT
CAAGTTTCAGCCCTGAAGCGGTTGACCTCATTGACAAGCTGCTGGTGGTGGACCCAA
CCAAGAGACTGGGCTGTGACAGCCATGGATCGCTTGCCATAAGGGAACATCCTTGG
TTCCGAGGTATAAACTGGGACAAGCACCTCGATTGCAGTGTGGAAGTTCCTTCAGAG
ATCATGACACGCCTTCAGTTGGCCATAGACTTTCTTCCCGTGGATGATAGTTATCAA
GTGTTTGATCTCCAACCCGATGAAGACGATCCACCATGGCTTGATGGCTGGTGATAG
CTTGATGGCTCGTAGATCCCCCTTCTCCAAGCATCAATGGCACAGTACCGAATGGCT
ATAACAGAAGATGCACATTAAGTGCTCCATGAACAGATACCGTAGCGCTTAGGATTT
TTCGGTCGTCACAAATGACGGCTCTCTTGTGAGGTTTCAATGTTGTGTCACCCGATG
ATCTCTACTGGCACAAACCTCCAGGCTGAATCTTAAGGCCAGCTGTTTTAGGTGAGA
CGTTTACCTTGGTTCGAACTCACGCTCGTGTTGTTAAGCGCGAGTCGATGATGTATG

[illegible]

AAATGACGGTGTTCCCTTGAAAGTCTTGAAAGGCAATCAATTCGCTTATGTGTGTCCC
TTCCATGTGGTCATTAGGGAAGGGAACCGCTGCACTAGTCAGTAAACGAACATGGC
TTCAATTGTATAGCATAGCGGTAGAGGTTTCGTACGAAATGTGGTTGCAGTCGGTGA
TTATAGGCGCATTTCTCTGAACATGCACGAGAATCGTGCTCCTGAGTCTCCATCATTC
AGTGGTGCGAGCTCGC

FIGURE 2E

Nucleotide sequence of the full-length CK-1 from *Physcomitrella patens* (SEQ ID NO:18)

ATCCCGGGCTCACGTAGTGCCTGAAGTCTGTCTGAATTTTAGGGGATGAGAGGTAG
ATTTGAAGAATACTGGTGTCTAATTTTCTGTTAATTTTTCACCCTTGAGGTAGCTCAT
GGATTTGGGAGGTGATCGCATGAGAGCTCCTCAGAGGCAGTCTCGAGAATATCAAT
ATAGATCATTGGACGTCTTCACAGAGCAGCACGAGCAGTTGCAAAAGCAGCAGCAG
CAAGATGAGTATCAGAGAACAGAATTGAAGCTCGAGACACTGCCAAAAATGTTAAG
CAATGCGACCGTGTCTATCTTCCCCTCGAAGCAGTCCGGATGGACGTAGACTACGTAC
AGTCGCGAATAAGTATGCTGTGGAAGGTATGGTTGGGAGTGGCGCATTCTGCAAGG
TGTATCAGGGCTCCGATTTGACGAACCACGAGGTTGTGGGCATCAAGCTGGAGGAT
ACGAGAACTGAGCACGCTCAGTTAATGCACGAGTCGCGCTTGTACAACATATTGCG
GGGTGGGAAGGGAGTGCCCAACATGAGATGGTTCGGAAAAGAGCAAGACTACAAT
GTGATGGTGCTAGACCTATTGGGGCCGAACCTGTTGCACCTCTTTAAGGTGTGTGGG
CTAAGGTTTTTCGTTGAAGACCGTGATTATGCTCGGTTACCAAATGATTGACCGGGTG
GAATACGTGCATTCTCGAGGGCTCGTTCACCGTGACCTGAAGCCGGATAACTTCCTC
ATGGGCTGCGGTCGGCAAGGAAACCAAGTGTTTATTATAGATTTTGGCTTGGCAAAG
GAGTACATGGACCCGGCAACACGAAGGCATATCCCTTACCGAGATAGGAAGAGCTT
CACAGGGACGGCACGGTACGCTAGTAGGAATCAGCACAGAGGAATCGAGCACAGT
AGAAGAGATGACATAGAATCACTTGGTTACATTCTTATGTACTTTCTAAGAGGCAAT
TTGCCATGGCAAGGGAAGGGCGGGCAACGCCTCACTGACCAGAAGCAACACGAGTA
CATGCACAACAAAATCAAGATGAACACCACTGTGGAGGAGCTTTGTGATGGGTATC
CCAGTCAATTTGCCGACTTTTTGCACCACGCGCGAAGTCTAGGTTTCTACGAGCAGC
CTGACTACTGTTACCTCCGAAGCTTGTTCCGTGATCTTTTCATTTCAGAAAAAATTCCA

FIGURE 2E Continued

GCTCGACCATGTGTACGACTGGACTGTGTATACTCAACTCCCCCAGAATGGCTCTCT
GCAATCAGTGCGCAGCCAGAATTCCGCTGCTTCGTCCCATTTGCAAAATCGACCTTC
GAATGTATCATATTGTCCACCCTTGACCAAGTCGGAGTTCCGTCGTGAGGTTGTTGC
GGCGAATTAGGGCTTACGTTGGGAGGACTAGTGGTTCATCCTCTGCTCTGGTACTAA
AATAGCACAAGGTTGCTTACTGTTTCCCTCTCTCAAGTCTTACATGATTGTGAATGGG
GGTTTATGGAGTTGAGGATGAGGCAACTAAGCAGAGTGTAGGAAAAGAGTTGTAGA
CTCTCTAGTGTGTAGTGTGTAAATCAAGGCTTCTAGCATTGTGTCGGTAGCTTGTATG
GATCAGACTAGAAATGACTTTTATCCATTACAAGAATTTTTACTCGGAAAGCCCATGA
CGGTGATGATTTCAATACGTTGCACAAGCAACTTTCTTCTGTAATTGAAATAGAGGA
TCTGGTCTGAGTATGAGAAGATGGGCATGTTAACGC

FIGURE 2F

Nucleotide sequence of the full-length CK-2 from *Physcomitrella patens* (SEQ ID NO:19)

ATCCCGGGTTGTCGAGGACGGAGAGAGAAGAGAGAGAGAGAGAGAGAGAGAGGTG
TTGTTTAGGGGAGGCATGCGGGAGCAGGATTGGTGTAAAGTTCGTAAGGAGAAGGG
AGTACATGCAAGTGCGTGCTTGTCTGGATATCGGACAGCTGGATTTGTAAATAAGCGG
AGAGGAGGGTCGGTAATCAGGGGCGTACATCGATGGAGCCGCGTGTGGGAAACAA
GTATCGGCTGGGACGGAAAATTGGGAGCGGTTCTTTGGGGAGATCTATCTTGGGAC
CAATGTTTCAGACCAATGAGGAGGTCGGAATAAAGCTGGAAAGCATCAAGACGAAGC
ATCCACAATTGCTGTACGAGTCCAAGCTCTACCGGATACTACAAGGAGGAACTGGG
ATTCCCAATATCAGATGGTTCGGGATAGAAGGAGACTACAATGTCTTGGTTCTGGAT
CTGTTGGGGCCAAGTCTCGAAGACCTTTTCAACTTCTGCAGCCGGAAGTTCTCTTTA
AAGACTGTTCTCATGCTTGCTGACCAGCTGATCAACAGAGTGGAGTATGTGCATGCG
AAAAGCTTTCTTCATAGAGACATCAAGCCTGATAATTTTCTAATGGGGCTTGGTAGG
CGAGCAAACCAGGTCTACATTATTGATTTTGGTCTTGCCAAGAAGTACCGCGACCCT
TCCACGCATCAGCATATTCCCTACAGGGAGAACAAAAATCTGACAGGGACTGCTCG
GTATGCAAGCATCAACACTCATCTTGGTATTGAGCAAAGCAGACGAGATGATTTGG
AATCTCTTGGATATGTGCTCATGTACTTCCTGAGAGGCAGTCTTCCATGGCAAGGAC
TGAAAGCGGGAACCAAGAAGCAGAAGTACGAGAAGATCAGTGAGAAAAAATGTC
CACGCCCATTGAGGTCCTTTGTAAAAATTATCCTTCAGAATTCGCCTCGTACTTCCAC
TACTGCCGGTCCTTGCGTTTTGATGACAAACCCGACTATGCATATTTGAAAAGAATC
TTCCGTGACCTCTTTATTCGTGAGGGTTTTCAATTTGACTACGTTTTTACTGGACAA
TTCTGAAGTACCAGCAGTCACAAATTTCCGGTGGCAGTTCAACTCGACTGGGTGCTT
CTGCAGGGCAAACCAGTGGTGCACCTTGGAAGTGGGGCTACAGGAAGCCGAGACCTG

FIGURE 2F Continued

CAGCGGCCACCGAACCAATGGATCCTTCTCGGCGCAGGCTTCCTGGAGGAGCAAA
TGGCTCCGGGGTCGCAAATGCTTTGGACTCATCTAAGCACAAAAGTCCTGGACTTGA
TGAATCTGCTAAGGATTCTGCTCTTGCTGTTGTGTCAGAACCAGAGCGCATGCATAC
ATCTTCGTATGCAACTCGGGGGGGTTCTTCCTCCAGGCGAGCTGTCCTATCTAGCAG
CAGGCCCTCAGGGGCATCAGCAGAAGTCGTAGATTCTCTCGAACAGGGAGCAGTA
AGCTTGGTCCCACCAGCTTACGGTCGTCAGCAGGGATGCAGAGGAGCTCTCCAGTTA
CTTCGGACCCAAAGCGGATATCTAGCCGCCATCCACAACCGCCATCTGCCAACTTGA
GGATTTACGAAGCCGCTATCAAGGGAGTTGAATCACTTTCTGTTGAGGTGGATCAAA
GCCGTTATAAGTAGGCCCAGGCTTGTGGTTATATAGCCGGGCTCTGTCTTCTATCAA
ACCCTCTTGTTATGTAGATGAGAGTTGCTCTACATTTGGCAACAGCCTGATTGAGGG
GAAAACGGTGGTTCTGTCCTACAATGGTGCTAAGACTACAGGTCTCTCATACTTAGG
AATGAATGGATCTCTATCTTGTTACCATCAAACCATTGTCAGTGCTTTGTGTGGTAGC
TCTCTGCCATACGATTCCTAAGGTAAACGC

FIGURE 2G

Nucleotide sequence of the full-length CK-3 from *Physcomitrella patens* (SEQ ID NO:20)

GCGTTAACGGGAGGAAGGTCGGGGGAAGAGACGCTTGAGGCTGCTGAAAGGGGAT
TCACTCAGCGTCCCCACCCATTTCGTCAATCTGGCGCAGAAGATCGGAAAATCGGTCC
GACGGCCAGGTGTTATGTCCAAGGCCCGGGTTTACACAGATGTGAATGTCCAACGTC
CGAAAGATTATTGGGACTACGAGGCCCTCACCGTCCAATGGGGGGACCAAGACGAT
TACGAGGTAGTGCGTAAGGTGGGGCGAGGGAAATACAGTGAGGTTTTTGAAGGTGT
CAACGCCGTGAATAGTGAGCGTTGCGTTATGAAGATTTTGAAGCCAGTAAAGAAAA
AAAAGATCAAAAGAGAGATCAAGATTCTGCAAAACCTTTGTGGAGGGCCCAACATT
GTGAAGCTTCTGGACATTGTCCGTGATCAGCAATCGAAGACACCCAGCCTAATTTTT
GAGTATGTGAACAATACTGATTTCAAAGTGCTCTACCCCACTCTTACAGACTTTGAT
ATCCGATACTACATTCATGAGCTGCTCAAGGCTTTGGACTATTGCCATTCTCAAGGG
ATTATGCACAGGGATGTGAAGCCACACAACGTGATGATTGACCATGAGCAGCGGAA
GCTTAGGCTTATTGACTGGGGACTTGCCGAATTCTATCATCCTGGCAAAGAGTATAA
TGTGCGTGTTGCCTCTAGGTACTTCAAGGGTCCTGAGCTGCTGGTTGATCTTCAAGAT
TATGATTACTCTCTCGACATGTGGAGCTTGGGGTGTCATGTTTGCCGGCATGATATTTT
GGAAGGAGCCATTCTTTTATGGGCATGACAATTATGATCAACTTGTGAAGATTGCTA
AGGTGTTGGGAACTGATGAATTGAATTCCTATCTAAACAAATACCGCCTAGAGCTGG
ACCCCCATTTGGAAGCACTGGTTGGCAGGCATAGCAGGAAACCTTGGTCAAAGTTC
ATCAATGCTGATAATCAGCGTCTGGTTGTTCCAGAGGCTGTGGATTTTTTGGATAAG
CTTCTACGCTACGATCATCAAGACAGGCTGACTGCGAAGGAAGCTATGGCACATCC
CTATTTTTATCCCGTGAAGGTGTCGGAGGTTAGCAACCGTCGCAGTGCTTGATATGA

FIGURE 2G Continued

ATTGATATATCTCATATGGGCTTTCTTGTGATTACGTCCCACCCGGCTACCAGGTTTC
TCAGTTGTGCGAAGCGCTGAGCTCGC

[illegible]

FIGURE 2H

Nucleotide sequence of the full-length MPK-2 from *Physcomitrella patens* (SEQ ID NO:21)

ATCCCGGGCGAGCCATGGCGCCACTTGCTTCGGCGAATGGGACTGTTTGACTTCTTC
GCTTCGCCCCCGCCTCGCCCTTCACCCTCCTCTGTTCTTGTCACAGCCTCCTCCTCCG
TCTCTGTCTGTTGGCTGGGTAAGTTTTGGGAGTGAGGAGGACGTGGTCATGGAAGAA
GAGCCCCCTCTTTTGTAGTGGACTGTCGGTAAATTGGACCTGGAGCCTGCCGGCTC
ATCGCGTTTGCTTAGATTGTGGGCGGGTGCTGTTGAAATTCCTTGAAGTTGCTACTGG
TCGGAAACGCTCGAATTGCGACTTTGATTGAAGGTCTGGTTGTTGCTGCGGTCGGGA
TCTTACTCAGTCTCTTCAATAGGACCTCTGAAGCAGTATGGAGACTAGCAGTGGAAC
TCCAGAATTGAAAGTTATAAGTACTCCGACCTACGGAGGTCATTACGTGAAATATGT
TGTGGCGGGAAGTGAATTCGAAGTCACCGCGAGGTACAAGCCACCACTTCGTCCGAT
TGGGCGCGGAGCTTATGGAATCGTCTGTTCACTCTTTGATACCGTTACGGGTGAGGA
GGTGGCGGTCAAAAAGATTGGAAACGCCTTCGACAACAGGATCGATGCGAAGCGAA
CACTGCGTGAAATAAACTCCTCCGGCATATGGATCATGAAAACGTCGTTGCCATTA
CAGACATCATTCGTCCCCCACTAGGGAGAATTTCAACGACGTGTACATTGTATACG
AGTTGATGGATACGGACCTACACCAGATCATTCGTTCAAATCAAGCTCTCACAGAAG
ACCACTGTCAGTATTTTCTGTATCAAATCTTGCGGGGCTTGAAGTACATCCATTCGGC
GAACGTCTTGACCGGGACTTGAAGCCCACCAACCTTCTCGTCAATGCCAATTGCGA
TTTGAAAATCGCAGATTTTGGCTTGGCACGCACTCTCTCTGAAACGGATTTCATGAC
TGAGTATGTTGTAACGAGGTGGTACAGAGCTCCAGAGCTGCTCCTGAATTGTTACAGC
ATACACTGCAGCTATTGACATTTGGTCTGTGGGGTGCATCTTCATGGAGTTGCTTAA
CCGATCTGCGTTGTTCCCTGGGAGAGACTATGTGCATCAGCTCCGCCTAATTACAGA
ACTCATCGGAACTCCTGAAGATAGGGATCTTGGGTTTTTGTGAGAAGCGACAATGCTAG

Year	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

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FIGURE 2I

Nucleotide sequence of the full-length MPK-3 from *Physcomitrella patens* (SEQ ID NO:22)

ATCCCGGGCTTGTATTGGCTCGGATAATTTATGTTGACAATTGATTTGTGAGGCTTCG
TATTGAGTCAGCGAGCAGGCTGAGAGTTCGGCAGCGAAGTTACACTCGACCTGGCT
GAAATTTGGAATTGAAGCGCGTGAAGCTTCATCTGTGATTTTGGAGGTTGTTTGACT
GATGAGAAGAGGTCTCTGAGCTGAGAATGTTTGCAATTTAGGGGCACCACCGGTTTG
TTGGAGTCCCTTGCCACTTATTACAATTGTTGGTTTACAAGCTCGACGAGTTTCAATC
GAACGTAGAGTTTTAGTCGGGTCGAGGATCTATGTATCCGCTCAGCGGAGAAGAGA
GCCTGATGTTGCCGAAGCGATCGTGTGGGATTTGACTAGAAAGAGGTGGACCGCAT
CAGAACTATTTATTCCTTGTGAGGGAAGGATCGAGGTTCCAATGGGTCTCACTCCGT
TTTCTTGTGTCACGGTTCAAGGTTATGTCCGGGTGGTCTACCCCGACGGCCACGTCG
AGAATCTGAGCAAATCTTGTAGCGTGCACGATCTTCTTCTGGGTAAATCCAGACTACT
ATGTCTGCGGTAGCACCCCTTACACAATCACCAATCGTATGGCAGCGGAAGAGGTG
CTCGAGTATGGGGTGACCTACTTCGTTTGCGCAACGCCAAATGCCCAACCTTTCTTA
GAACGTCAGCCGAAGGTAGTACATCGAGGATCCAAGATTTTGCCACGATTTTCCAAA
CATGGGGTCCATGTGCGGGAGTTGCGAAGCCCGACGCATGGGAGCCAACAGTCACG
GAAGGTTTTTTGATTATCATTACAGTAACGATGCAGCAGCTTGAATCCATACGAAACGA
GGGCCCAGAGCCTCACCTCGCTGGAGACCGACCATCGAAGCACCTTAAGCTCGTTTT
CATTCGGCATTGCTTGCGAGCACTTCGACTTCCTAGAATTTCAATAGACCTAATGGA
ATCGCCACTCCCTAATCTTTCCGGAGAGGCCTTATCGCCGACGGCAACTGCCAAAGA
CGAGATTACTCAGATGATACTAAAAAGTGCCGCAAGGTCCGAATTAGGAATGTATG
TTTCGAAGAGACAGGAATTCTATCTTCGAAGAGCGCGTAGGCGGGCGTAAGTTTGCGT
GGAAGCCGGTTTTTGCAGAGCATCTCCGAGATGAAGCCTGTCATGGAATTCCACACTC

FIGURE 2I Continued

CGATGGCTTACCGGGATAGTGGGTCTCCGCCGAAGAACGCCTCTACCCCATCCTTAC
CTGGCCCGAAGAACATTTACCGCCACGACAAGTGAGTGTCCCGCAAAGGAGCAGT
CCTCCGCCGAAGAACGTCTCACCACCTCCCCAGCCCGCATTGTAGCGCGGACTGCG
TCGAAGTATTCTGCTGCATCTCAGCAAGTTCAACGAAATCGAGGCAACGCGAAATCT
CTTTATATGGCGTAGTTTGTGTCTCGACTGAACTCCTATCTATTCCCCCATCGAGATA
ACTGCATTTCGTTGGATAAATTTCTCCAACATTTTTGCTCTTCATCCTCAAGCAGCTCC
TCAATGGCCAGTAATATGTTACGACATTGTGCACAACCTCCAATTACGTAGCGTTATT
CTGTAACCCACGTTTCATCGAGGTATCAAGGAATGGCGCAGTAAGCACTGCTACTTTG
TGCTTTGGTATCCCGTTGTGACGAGATGTCATGTCGCACCGTGCCTATCAGTGGGAT
TTTCTTGAGCGCAGATCTTGCTTCCGCAGTTTGTTCATAACGTTTTGGTTTCGTAGGG
GGCCTAGACGGTACTATCAAGCAATGAGAAGTGTGCTGGTGTGGATTTGACAGCAA
TCTTTTGGAGGATTGTCTTTCCTATGTAGAACATAGCGAGGACACTTGCGCCTGGTG
GGCACATCCCATAGAACATAGTGCTTCACTTCTGGGTTGTTCACTACTAGGATCATA
TGACCTTCTCATCTATTTTCGGGCTTTGTTTCGAGCTCATGTACCATCGACTAGCGTC
ACTTTGACTGCGGTGATAATCGTTTGTCAATTTAGTGGAGCTTTGTAGATGATAGAT
GCCATTTGTACAGTAGCTTGGATGCTGTTTACAAGATAGCGGCAGCTAGAAGCCTTA
AACCTTTAGCTACCATGTATTATTTAAACCTATATGAAGTGAACGGCTGTGCAGAT
ATTGCCGTTAACGC

FIGURE 2J

Nucleotide sequence of the full-length MPK-4 from *Physcomitrella patens* (SEQ ID NO:23)

ATCCCGGGCGGTCGAGTCGTATTAGGTGTTGTTTCATTGTAAGGGTTCGGAAGCACG
GGGCACGGCGTATATACCGTTCCCCTTGAACGTTGATCTCACCTTTGGAAGACCTGA
ATTGAGTAGCGTGCGGAAGCTGCATCGATCCGGAAGAGACGATGAGTAGGAGAGTG
AGAAGGGGAGGTCTTCGCGTCGCGGTGCCGAAGCAAGAGACTCCCGTCAGCAAATT
TTTGA CTGCCAGTGGA ACTTTCCAGGATGATGATATCAAGCTCAACCACACCGGGCT
TCGCGTCGTCTCTTCAGAACCTAACCTTCCTACGCAGACGCAGTCTAGCTCCCCAGA
TGGGCAACTGTCAATAGCAGACCTGGAGTTAGTGCGGTTCTTGGGAAAGGGTGCGG
GTGGAACCGTGCAGCTTGTCCGGCACAAATGGACCAATGTCAATTATGCACTGAAG
GCGATACAAATGAATATCAACGAAACAGTGAGGAAGCAGATTGTTTCAGGAGCTGAA
AATCAACCAAGTGACGCACCAGCAGTGCCCTTATATCGTGGAATGCTTCCACTCCTT
CTACCACAACGGCGTCATATCCATGATCCTAGAGTACATGGACAGGGGCTCGTTGTC
CGACATTATTAAGCAACAAAAGCAGATACCTGAGCCGTATTTGGCCGTCATTGCTAG
TCAAGTTCTGAAGGGATTGGAATACCTACACCAAGTCAGGCACATCATA CATCGTGA
TATAAAGCCCTCCAACCTCCTCATCAATCACAAGGGTGAGGTCAA AATATCTGATTT
TGGTGTCAGTGCTGTGTTGGTTCATT CCTTGGCCCAGCGAGACACGTTTCGTTGGGAC
TTGCACATATATGTCGCCAGAACGCCTTCAGGGGGCGTTCGTATGCATACGACAGTGA
CCTATGGAGTTTAGGATTGACTCTTTTGGAGTGTGCGTTGGGTACCTTCCCATACAA
ACCAGCTGGAATGGAAGAGGGTTGGCAAAATTTCTTCATCCTCATGGAATGTATAGT
TAATCAACCCCCCGCAGCCGCATCCCCTGACAAATTCTCCCCGAATTTTGTTCCTTT
ATTGAATCCTGCATCCGGA AATGTCCCAGTGAACGACCATCAACTACTGATTTACTT
AAACATCCGTTCTTGCAAAAGTACAACGAGGAAGAGTACCATTTGAGCAAGATTTT

[illegible]

GTAACCTAAAGTTAGCCTCGCATGGCGTGCAAGAGACTGTCACCTACCACAAGCCTGAT
CCACCACTGAACTTCAAGGGACTTTACCAAAGCATGGTCGAACTACCTCGCCAATC
CGCCACTTTCTCAATGCCTTTTCCTTATATAGTCATATGTGGTCAAGTTGAGAACGAT
ATCAAATCAGATTGACGGAAAAACATCTTCAACGCCGTTTCCCAACCTTATAGAAA
GTGGAGTTTTCTCAATGAGCCCCATTTGTCGCTGAGAACGTGCAGCTCATGAAACAA
TCCATAAGTGTGTTAATCGGGGTCTTATATTATCATCACCATGCTAGCTTTTTATGTT
ACCTGCACTTTTTCTTTCCTTATTGCACAGCATCGAACACTTCTTCGATACCCAAAAC
AATATTTCCATCTTCTTTCTTCTTTTTTTTACGTCTTGCGACAAGGAATTTCTCACGG
AGATTTTTCAACACTTTTCTCAAATGTTTTTAGAGTTTTTAAACTGACAATTGAAGAG
GTCGGACCTACCGGACTCGC

FIGURE 2K

Nucleotide sequence of the full-length MPK-5 from *Physcomitrella patens* (SEQ ID NO:24)

ATCCCGGGAGAGGCTGATCTGATGCTACAGTTTCGTGTGCAGCTAGTCTTTAGAGAT
TCGGGCAACGCACTTGTTGAAGATCGGAACTTTCAAATCGGTCGAGTCGTATTAG
GTGTTGTTTCATTGTAAGGGTTCGGAAGCACGGGGCACGGCGTATATACCGTTCCCC
TTGAACGTTGATCTCACCTTTGGAAGACCTGAATTGAGTAGCGTGCGGAAGCTGCAT
CGATCCGGAAGAGACGATGAGTAGGAGAGTGAGAAGGGGAGGTCTTCGCGTCGCG
GTGCCGAAGCAAGAGACTCCCGTCAGCAAATTTTGGTACTGCCAGTGGAACCTTCCAG
GATGATGATATCAAGCTCAACCACACCGGGCTTCGCGTCGTCTCTTCAGAACCTAAC
CTTCCTACGCAGACGCAGTCTAGCTCCCCAGATGGGCAACTGTCAATAGCAGACCTG
GAGTTAGTGCGGTTCTTAGGAAAGGGTGCGGGTGGAACCGTGCAGCTTGTCCGGCA
CAAATGGACCAATGTCAATTATGCACTGAAGGCGATACAAATGAATATCAACGAAA
CAGTGAGGAAGCAGATTGTTTCAGGAGCTGAAAATCAACCAAGTGACGCACCAGCAG
TGCCCTTATATCGTGGAATGCTTCCACTCCTTCTACCACAACGGCGTCATATCCATGA
TCCTAGAGTACATGGACAGGGGCTCGTTGTCCGACATTATTAAGCAACAAAAGCAG
ATACCTGAGCCGTATCTGGCCGTCATTGCTAGTCAAGTTCTGAAGGGATTGGAATAC
CTACACCAAGTCAGGCACATCATACATCGTGATATAAAGCCCTCCAACCTCCTCATC
AATCACAAGGGTGAGGTCAAATATCTGATTTTGGTGTGAGTGCTGTGTTGGTTCAT
TCCTTGCCCCAGCGAGACACGTTTCGTTGGGACTTGACATATATGTCGCCAGAACGC
CTTCAGGGGCGTTTCGTATGCATACGACAGTGACCTATGGAGTTTAGGATTGACTCTT
TTGGAGTGTGCGTTGGGTACCTTCCCATACAAACCAGCTGGAATGGAAGAGGGTTG
GCAAAATTTCTTCATCCTCATGGAATGTATAGTTAATCAACCCCCCGCAGCCGCATC
CCCTGACAAATTCTCCCCGAATTTTGTCTTTTATTGAATCCTGCATCCGGAAATGT

[illegible][illegible]

FIGURE 2L

Nucleotide sequence of the full-length CPK-1 from *Physcomitrella patens* (SEQ ID NO:25)

ATCCCGGGTGTAGGCGGGCGAGGTTTCGATGCAATGGGGCAGTGTTATGGAAAGTTT
GATGATGGAGGCGAAGGGGAGGATTTGTTTGAGCGGCAGAAAGTGCAGGTTTCTAG
GACGCCAAAGCATGGATCGTGGAGCAATAGCAACCGAGGGAGCTTCAACAATGGCG
GGGGGGCCTCGCCTATGAGAGCCAAGACGTCGTTTCGGGAGCAGCCATCCGTCCCCG
CGGCATCCCTCAGCTAGTCCGCTCCCTCACTACACGAGCTCCCCAGCGCCTTCGACC
CCGCGACGGAACATTTTCAAAAGGCCTTTTCCTCCTCCTTCTCCCGCGAAGCACATT
CAGTCCAGTCTCGTGAAACGGCATGGCGCGAAGCCGAAAGAAGGAGGGGCGATCCC
TGAGGCTGTTCGATGGTGAGAAGCCCTTGGATAAGCATTTTCGGCTATCACAAGAACTT
CGCTACTAAGTATGAGCTGGGGCATGAAGTCGGTCGCGGGCACTTCGGTCACACAT
GTTACGCGAAAGTACGGAAGGGCGAGCATAAGGGACAAGCCGTGGCAGTGAAGAT
AATCTCGAAAGCGAAGATGACGACTGCTATTGCGATCGAGGACGTGGGACGAGAAG
TGAAAATTTTGAAGGCTCTGACGGGACACCAGAATTTGGTTTCGATTCTACGATTCCT
GCGAGGACCATCTAAATGTGTACATTGTTATGGAATTATGTGAAGGAGGTGAATTAT
TGATCGAATTTTGTCTCGGGGAGGGAAGTACTCGGAGGAAGACGCCAAGGTTGTT
GTGCGGCAGATTTTGAGCGTTGTTGCGTTTTGTACCTGCAAGGCGTTGTTACCGA
GATCTTAAGCCTGAGAATTTTCTGTTTACCACGAAGGATGAATATGCTCAGCTTAAG
GCCATTGATTTTGGATTGTCAGATTTTCATCAAACCCGATGAAAGACTGAACGATATC
GTTGGAAGCGCATACTACGTTGCGCCGGAGGTATTGCATAGGTTATATTCAATGGAA
GCTGACGTATGGAGCATTGGAGTCATCACGTACATTTTGTATGTGGTAGTCGACCG
TTTTGGGCGCGGACCGAGTCGGGCATTTTTCGTGCGGTGTTGAGGGCTGACCCGAGC
TTTGAAGAAGCCCCTTGGCCTTCCATCTCTCCCGAAGCCAAGGATTTTCGTGAAGCGT

FIGURE 2L Continued

CTCCTGAATAAGGATATGCGGAAACGCATGACTGCTGCACAAGCTTTAACTCATCCA
TGGATTCTGAAGTAACAACGTGAAGATACCTCTGGATATCTTAGTGTACAGACTTGTG
AGGAATTATCTTCGTGCATCATCCATGAGAAAGGCTGCTTTGAAGGCCCTGTCAAAG
ACTTTAACCGAAGACGAGACTTTTTATCTACGTACTCAATTTATGCTGCTAGAACCA
AGTAACAACGGTCGTGTTACTTTTGAGAATTTTCAGACAGGCACTGCTGAAAAATTCA
ACAGAGGCCATGAAAGAGTCACGGGTTTTTGAAATTCTGGAATCGATGGATGGTCTT
CATTTCAAGAAAATGGACTTTTCAGAGTTCTGTGCAGCGGCCATTAGTGTTCTCCAG
TTAGAAGCCACAGAACGATGGGAGCAGCATGCTCGCGCAGCTTACGACATATTTGA
GAAAGAGGGTAACCGAGTCATTTATCCTGATGAACTTGCGAAAGAGATGGGACTAG
CACCAAATGTACCAGCCCAAGTGTTTCTAGATTGGATTAGACAGTCTGATGGTCGGC
TGAGTTTCACTGGGTTACCAAGCTGCTACATGGAATTTCCAGCCGTGCTATCAAAA
ATCTCCAGCAGTGATTCTTTGCATCGTACAGTTCGGAATGGAGTTTTTAAGCTCTTTT
AGTTTCACTTCCGTCTTCAACTGCTGCTTCGCCTCGTCTCTGAGCTGTGATAGCGTAT
CTCAAGCATATGCACAACCTCGCATTTTTTGCTGAAGTGATTTGTACCTCACATTAGTC
GGGCCTCTGGAACTTTCACTTATTTGGATTATTTATGTAGAAGTCCAGATCAAAAAG
CGAAAAGGAATGGCTAGATATTGTCACAAGAAGTAACATAGTCAAATTCAGGAGCA
CTTAAGCACACATTGAGTGCTTTTTATTGGAATTCTTAGATATGGAACCTGATGTTTCC
AAGGGAAGGGTCTATGAGGCAGAGAGTGGAATGTATAGACTGGCATATGGTTAAGT
GATCATTGGACTGCCGTTCTACTCCGGTTGTCGTTAACGC

FIGURE 2M

Nucleotide sequence of the full-length CPK-2 from *Physcomitrella patens* (SEQ ID NO:26)

ATCCCGGGCGAACTGCGATCTGAGATTCCAACCTTGGAAGGGCCTCGCGTAAGACCG
GATCTCGTTTCTTACGCTTTTGCGCCTCGCGATATTTGTACATTGTTTCCTCTGGTTTT
ATTCGATTCCGCCTCTGAAAATGTGAACGGGCTGCAAGCTTGGTTTTGGAGCAACGT
TGGAGCATTGAAGGGTTGCGCTCGTCCCTGCCATTCTCGCTTCTGCTCTGGCCTAT
GTCATGACGACGTGAAGGAGAGGATTTGAGGGTTTTGTAAGTGATATAATCCTCCCC
GAGGAGATTTCTGTGAGTTGATTAACCTGGATCAGCGACATGGGGAACACTAGTTCG
AGGGGATCGAGGAAGTCCACTCGGCAGGTGAATCAGGGAGTCGGGTCTCAAGACAC
CCGAGAGAAGAATGATAGCGTCAATCCAAAGACGAGACAGGGTGGTAGCGTTGGCG
CAAACAACCTATGGCGGAAAGCCAAGCAGTGGTGCTCAGGCCGGAGAACGATCCACC
TCTGCGCCCGCTGCTCTGCCGAGGCCGAAGCCAGCATCGAGGTCAGTATCCGGTGTT
TTGGGTAAGCCGCTGTCAGATATTCGTCAATCTTACATCCTGGGACGGGAGCTTGGC
CGAGGGCAGTTCGGAGTGACTTACTTGTGTACTGACAAGATGACGAATGAGGCGTA
CGCGTGCAAGAGCATCGCCAAACGGAACTGACCAGTAAGGAGGATATCGAGGATG
TTAAGCGGGAGGTTTCAGATTATGCATCACCTGTCGGGGACACCCAATATCGTGGTGT
TAAAGGATGTGTTTCGAGGACAAGCATTCCGTGCATCTTGTGATGGAGCTCTGTGCAG
GTGGCGAGCTCTTCGATCGCATCATTGCCAAGGGGCATTACAGTGAGCGCGCCGCTG
CCGATATGTGCAGAGTCATCGTCAATGTGGTGCACAGATGCCACTCATTAGGGGTCT
TCCATCGGGATCTCAAGCCAGAGAATTTTCTGTTGGCCAGCAAGGCTGAGGATGCGC
CTCTGAAGGCCACAGACTTCGGTCTGTCAACTTTCTTTAAGCCAGGAGATGTGTTCC
AGGATATTGTTGGAAGTGCGTATTACGTGGCCCCTGAAGTTTTGAAGAGAAGTTATG
GTCCTGAAGCTGATGTTTGGAGTGCAGGCGTGATTGTGTACATTCTGCTGTGTGGTG

FIGURE 2M Continued

TACCCCCCTTCTGGGCTGAAACTGAGCAGGGTATCTTTGACGCTGTGCTCAAAGGGC
ACATAGACTTCGAGAACGATCCATGGCCGAAAATCTCCAACGGGGCTAAGGATTTG
GTGAGGAAAATGCTAAACCCTAACGTGAAGATACGTCTGACGGCACAGCAGGTGTT
GAACCATCCATGGATGAAGGAAGATGGTGATGCTCCAGACGTGCCACTCGACAATG
CGGTGTTGACCAGACTGAAAAATTTCTCAGCCGCCAACAAGATGAAAAAGCTGGCG
CTGAAGGTGATTGCAGAGAGTCTGTCTGGAGGAAGAGATCGTGGGGTTGAGGGAGAT
GTTCAAATCCATAGATACAGACAACAGCGGCACGGTGACGTTTCGAGGAGCTTAAGG
AAGGGTTGCTGAAGCAGGGCTCAAACTTAATGAATCGGACATCAGGAACTAATG
GAAGCTGCAGATGTCGATGGAAACGGCAAGATCGACTTCAACGAGTTCATATCGGC
AACAATGCACATGAACAAGACGGAGAAAGAGGATCACCTTTGGGCAGCATTCATGC
ATTTTCGACACGGACAATAGCGGGTATATCACCATCGACGAGCTTCAGGAAGCAATG
GAGAAGAATGGAATGGGAGATCCTGAGACCATCCAAGAGATCATCAGCGAGGTGG
ACACAGACAACGACGGAAGAATAGACTACGACGAGTTCGTAGCCATGATGCGCAAG
GGCAATCCTGGCGCTGAAAACGGAGGAACGGTGAACAAGCCCAGACACAGGTAGT
AGCTCCTGGTTGCCAATTTGACGACGGGTTTGGCAAGGCAACAGTAGTTGTTGTTAG
CTTTCAGATTCAGGTTCGGTATTGTTTCATGCCCTCCTTTGTCTCGAACAATGGACTCT
AGGCCTTTCCAATGGAAAAGCTATTCCAACAGGGTTTGCATAACGTGTAGTAGAATG
AAAGCATTGCCTGGGGGGTGTACAGTGCCTGTGATCTTGTGGAGTTCTCGTAGGATG
GCTTCGGTTGGATCTCGTTAACGC

FIGURE 3A

Deduced amino acid sequence of PK-6 from *Physcomitrella patens* (SEQ ID NO:27)

MGVDMKAPAKQSLGVGLLLCSVVILSVVSSVYGQVQTDPVDTTGLISMWYDLKQSQSL
TGWTQNASNPCGQQWYGVVCDGSSVTEIKIGSRGLNGNFNPSYFQNAFKKLRFDASN
NNIEGNIPQQFPTSLTQMILNNNKLTGGLPQFDQLGALTVVNLSNNNLTGNMNPNYFNV
IVNVETFDVSYNQLEGTLPDSILNLAKLRFLNLQNNKFNGKLPDDFSRLKNLQTFNIEND
QFTGNYPISGLPSNSRVGGNRLTFPPPPAPGTPAPRTPSPSGTSNGSSSHLPLGAIIGIAAGG
AVLLLLLALGICLCCRKRSKKALGDPEATTSSRRPWFTPPLSAKSQSDPSKSIDKTTKRNI
FGSSKSEKKSSKHRVFEPAPLDKGAADPEVVKASPPVKVLKAPPSFKGISGLGAGHSKAT
IGKVNKSNI AATPF SVADLQAATNSFSQDNLIGEGSMGRVYRAEFPNGQVLAVKKIDSS
ASMVQNEDDFLSVVDSLARLQHANTAELVGYCIEHDQRLLVYEYVSRGTLNELLHFSG
ENTKALSWNVRIKIALGSARALEYLHEVCAPPVVHHNFKSANILLDELNPHVSDCGLA
ALAPSGSERQVSAQMLGSFGYSAPEYAMSGTYTVKSDVYSFGVVMLELLTGRKSLDSS
RPRSEQSLVRWATPQLHDIDALARMVDPSLKG IYPAKSLSRFADIVALCVQPEPEFRPPM
SEVVQALVRLMQRASLSKRRSESAVGIESNEPSETSL*

1000 900 800 700 600 500 400 300 200 100 0

FIGURE 3B

Deduced amino acid sequence of PK-7 from *Physcomitrella patens* (SEQ ID NO:28)

MSVSGMDNYEKLEKVGEGTYGKVYKARDKRSGQLVALKKTRLEMEEEGVPSTALREV
SLLQMLSHSMYIVRLLCVEHVEKGSKPMLYLVEFYMDTDLKKYIDLHGRGPSGKPLPPK
VVQSFMYQLCTGLAHCHGHGVMHRDLKPQNLLVDKQTRRLKIADLGLGRAFTVPMKS
YTHEIVTLWYRAPEVLLGATHYSLPVDIWSVGCIFAELVRKMPLFTGDSELQQLHIFRL
LGTPNETIWPGVSQHRDWHEFPQWRPQDLSLAVPGLSAVGLDLLAKMLVFEPKRIKSAK
AALSHTYFADVDKTAT

MSVSGMDNYEKLEKVGEGTYGKVYKARDKRSGQLVALKKTRLEMEEEGVPSTALREV
SLLQMLSHSMYIVRLLCVEHVEKGSKPMLYLVEFYMDTDLKKYIDLHGRGPSGKPLPPK
VVQSFMYQLCTGLAHCHGHGVMHRDLKPQNLLVDKQTRRLKIADLGLGRAFTVPMKS
YTHEIVTLWYRAPEVLLGATHYSLPVDIWSVGCIFAELVRKMPLFTGDSELQQLHIFRL
LGTPNETIWPGVSQHRDWHEFPQWRPQDLSLAVPGLSAVGLDLLAKMLVFEPKRIKSAK
AALSHTYFADVDKTAT

FIGURE 3C

Deduced amino acid sequence of PK-8 from *Physcomitrella patens* (SEQ ID NO:29)

MADAKEELALRTEMLHWAVRSNDVGLLRITLKKDKQLVNAADYDKRTPHIAASLDCV
PVAKVLLAEGAELNAKDRWGKSPRGEAESAGYMEMVKLLKDYGAESHAGAPRGHVE
SLIQVAPPLPSNRDWEIAPSEIELDTSELIGKGAFGEIRKALWRGTPVAVKTIRPSLSNDR
MVIKDFQHEVQLLVKVRHPNIVQFLGAVTRQRPLMLVTEFLAGGDLHQLLRNPNLAP
DRIVKYALDIARGMSYLNRSKPIIHRDLKPRNIIVDEEHELKVGDFGLSKLIDVKLMHD
VYKMTGGTGSYRYMAPEVFEBQPYDKSVDVFSFGMILYEMFEGVAPFEDKDAYDAAT
LVARDDKRPEMRAQTYPPQMKALIEDCWSPYTPKRPPFVEIVKKLEVMYEDCLRLPK
DRRHRLRDILHLRRNPADS*

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[illegible]

MKRYQRRKVQRLGREGQVLLERTLFKQLRPSPFVPHLLATPIDSDNVALVLNCVLAGPL
 ELLRSPLDENSARFLVANVVLAVELLHKDGVVYRGISPDVLMIDRKGRQLQVDFRFAK
 QMSDERTFTVCGMADFLAPEIIQGQGHGLASDWWAVGVLMYFMLQTELPFGSWRDNEL
 EIFGRIARRQLTFPSSFSPEAVDLIDKLLVVDPTKRLGCDSHGSLAIREHPWFRGINWDKH
 LDCSVVEVPSEIMTRLQLAIDFLPVDDSYQVFDLQPDEDDPPWLDGW*

FIGURE 3E

Deduced amino acid sequence of CK-1 from *Physcomitrella patens* (SEQ ID NO:31)

MDLGGDRMRAPQRQSREYQYRSLDVFTQHEQLQKQQQQDEYQRTELKLETLPKMLS
NATVSSSPRSSPDGRRLRTVANKYAVEGMVGSAGFCKVYQGSDLTNHEVVGIKLEDTR
TEHAQLMHESRLYNILRGGKGVNMRWFGKEQDYNVMVLDLLGPNLLHLFKVCGLRF
SLKTVIMLG YQMIDRVEYVHSRGLVHRDLKPDNFLMGCGRQGNQVFIIDFGLAKEYMD
PATRRHIPYRDRKSFTGTARYASRNQHRGIEHSRRDDIESLGYILMYFLRGNLPWQGKG
GQRLTDQKQHEYMHNKIKMNTTVEELCDGYPSQFADFLHHARSLGFYEQPDYCYLRSL
FRDLFIQKKFQLDHVYDWTVYTQLPQNGSLQSVRSQNSAASSHLQNRPSNVSYCPPLTK
SEFRREVVAAN*

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

MEPRVGNKYRLGRKIGSGSFGEIYLGTVNQTNEEVGIKLESIKTKHPQLLYESKLYRILQ
GGTGIPNIRWFGIEGDYNVLVLDLLGPSLEDLFNFCSRKFSLKTVLMLADQLINRVEYVH
AKSFLHRDIKPDNFLMGLGRRANQVYIIDFGLAKKYRDPSTHQHIPYRENKNLTGTARY
ASINTHLGIEQSRDDLESLGYVLMYFLRGSLPWQGLKAGTKKQKYEKISEKKMSTPIEV
LCKNYPSEFASYFHYCRSLRFDDKPDYAYLKRIFRDLFIREGFQFDYVFDWTILKYQQSQ
ISGGSSTRLGASAGQTS GALGTGATGSRDLQRPTEPMDPSRRRLPGGANGSGVANALDS
SKHKSPGLDESAKDSALAVVSEPERMHTSSYATRGGSSSRRAVLSSSRPSGASAEVVDSS
RTGSSKLGPTSLRSSAGMQRSSPVTSDPKRISSRHPQPPSANLRIYEAAIKGVESLSVEVD
QSRYK*

FIGURE 3G

Deduced amino acid sequence of CK-3 from *Physcomitrella patens* (SEQ ID NO:33)

MSKARVYTDVNVQRPKDYWDYEALTVQWGDQDDYEVVRKVGRGKYSEVFEGVNAV
NSERCVMKILKPVKKKKIKREIKILQNLCGGPNIVKLLDIVRDQQSKTPSLIFEYVNNTDF
KVLYP TLTDFDIRYYIHELLKALDYCHSQGIMHRDVKPHNVMIDHEQRKLRLIDWGLAE
FYHPGKEYNVRVASRYFKGPELLVDLQDYDYSLDMWSLGCMFAGMIFRKEPFFYGH
NYDQLVKIAKVLGTDELNSYLNKYRLELDPHLEALVGRHSRKPWSKFINADNQRLVVP
EAVDFLDKLLRYDHQDRLTAKEAMAHYPYFYPVKVSEVSNRRSA*

MSKARVYTDVNVQRPKDYWDYEALTVQWGDQDDYEVVRKVGRGKYSEVFEGVNAV
NSERCVMKILKPVKKKKIKREIKILQNLCGGPNIVKLLDIVRDQQSKTPSLIFEYVNNTDF
KVLYP TLTDFDIRYYIHELLKALDYCHSQGIMHRDVKPHNVMIDHEQRKLRLIDWGLAE
FYHPGKEYNVRVASRYFKGPELLVDLQDYDYSLDMWSLGCMFAGMIFRKEPFFYGH
NYDQLVKIAKVLGTDELNSYLNKYRLELDPHLEALVGRHSRKPWSKFINADNQRLVVP
EAVDFLDKLLRYDHQDRLTAKEAMAHYPYFYPVKVSEVSNRRSA*

FIGURE 3H

Deduced amino acid sequence of MPK-2 from *Physcomitrella patens* (SEQ ID NO:34)

METSSGTPELKVISTPTYGGHYVKYVVAGTDFEVTARYKPPLRPIGRGAYGIVCSLFDTV
TGEEVAVKKIGNAFDNRIDAKRTLREIKLLRHMDHENVVAITDIIRPPTRENFNDVYIVY
ELMDTDLHQIIRSNQALTEDHCQYFLYQILRGLKYIHSANVLHRDLKPTNLLVNANCDL
KIADFGLARTLSETDFMTEYVVTRWYRAPELLNCSAYTAAIDIWSVGCIFMELLNRSAL
FPGRDYVHQLRLITELIGTPEDRDLGFLRSDNARRYIKHLPRQSPIPLTQKFRGINRSALDL
VEKMLVFDPAKRITVEAALAHPLYLASLHDINDEPASVSPFEFDFEPPISEEHIKDLIWRE
ALDCSLGPDDMVQ*

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MGLTPFSCVTVQGYVRVVYPDGHVENLSKSCSVHDL L L L GNP DY Y VCGSTPYTITNRMA
AEEVLEYGV TY FVCATPNAQPFLERQPKVVHRGSKILPRFSKHGVHVRELRSPTHGSQQ
SRKVFDYHSVTMQQLESIRNEGPEPHLAGDRPSKHLKLVFIRHCLRALRLPRISIDLMESP
LPNLSGEALSPTATAKDEITQMILKSAARSELGMYVSKRQEFYLRRARRRRKFAWKPV L
QSISEMKPVMEFHTPMA YRDSGSPPKNASTPSLPGPKNISPPRQVSV PQRSSPPPKNVSPP
PQPAFVARTASKYSAASQQVQRNRGN AKSLYMA*

FIGURE 3J

Deduced amino acid sequence of MPK-4 from *Physcomitrella patens* (SEQ ID NO:36)

MSRRVRRGGLRVAVPKQETPVSKFLTASGTFQDDDIKLNHTGLRVVSSEPNLPTQTQSS
SPDGQLSIADLELVRFLGKGAGGTVQLVRHKWTNVNYALKAIQMNINETVRKQIVQEL
KINQVTHQQCPYIVECFHSFYHNGVISMILEYMDRGSLSDIHKQKQIPEPYLAVIASQVL
KGLEYLHQVRHIIHRDIKPSNLLINHKGEVKISDFGVSAVLVHSLAQRDTFVGTCTYMSP
ERLQGRSYAYDSDLWSLGLTLLECALGTFPYKPAGMEEGWQNFFILMECIVNQPPAAAS
PDKFSPEFCSFIESCIRKCPSERPSTTDLLKHPFLQKYNEEEYHLSKIL*

MSRRVRRGGLRVAVPKQETPVSKFLTASGTFQDDDIKLNHTGLRVVSSEPNLPTQTQSS
SPDGQLSIADLELVRFLGKGAGGTVQLVRHKWTNVNYALKAIQMNINETVRKQIVQEL
KINQVTHQQCPYIVECFHSFYHNGVISMILEYMDRGSLSDIHKQKQIPEPYLAVIASQVL
KGLEYLHQVRHIIHRDIKPSNLLINHKGEVKISDFGVSAVLVHSLAQRDTFVGTCTYMSP
ERLQGRSYAYDSDLWSLGLTLLECALGTFPYKPAGMEEGWQNFFILMECIVNQPPAAAS
PDKFSPEFCSFIESCIRKCPSERPSTTDLLKHPFLQKYNEEEYHLSKIL*

FIGURE 3K

Deduced amino acid sequence of MPK-5 from *Physcomitrella patens* (SEQ ID NO:37)

MSRRVRRGGLRVAVPKQETPVSKFLTASGTFQDDDIKLNHTGLRVVSSEPNLPTQTQSSS
PDGQLSIADLELVRFLGKGAGGTVQLVRHKWTNVNYALKAIQMNNINETVRKQIVQELKI
NQVTHQQCPYIVECFHSFYHNGVISMILEYMDRGSLSDIKQQKQIPEPYLAVIASQVLKG
LEYLHQVRHIIHRDIKPSNLLINHKGEVKISDFGVSAVLVHSLAQRDTFVGTCTYMSPERL
QGRSYAYDSLWSLGLTLLECALGTFPYKPAGMEEGWQNFFILMECIVNQPPAAASPDK
FSPEFCSFIESCIRKCPSERPSTTDLLKHPFLQKYNEEEYHLSKIL*

MSRRVRRGGLRVAVPKQETPVSKFLTASGTFQDDDIKLNHTGLRVVSSEPNLPTQTQSSS
PDGQLSIADLELVRFLGKGAGGTVQLVRHKWTNVNYALKAIQMNNINETVRKQIVQELKI
NQVTHQQCPYIVECFHSFYHNGVISMILEYMDRGSLSDIKQQKQIPEPYLAVIASQVLKG
LEYLHQVRHIIHRDIKPSNLLINHKGEVKISDFGVSAVLVHSLAQRDTFVGTCTYMSPERL
QGRSYAYDSLWSLGLTLLECALGTFPYKPAGMEEGWQNFFILMECIVNQPPAAASPDK
FSPEFCSFIESCIRKCPSERPSTTDLLKHPFLQKYNEEEYHLSKIL*

Case	Age	Sex	Duration of illness (yr)	Onset	Course	Family history	Pathological findings	Diagnosis	Prognosis
1	45	M	10	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
2	55	F	15	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
3	65	M	20	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
4	75	F	25	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
5	85	M	30	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
6	95	F	35	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
7	105	M	40	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
8	115	F	45	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
9	125	M	50	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
10	135	F	55	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
11	145	M	60	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
12	155	F	65	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
13	165	M	70	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
14	175	F	75	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
15	185	M	80	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
16	195	F	85	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
17	205	M	90	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
18	215	F	95	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
19	225	M	100	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
20	235	F	105	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
21	245	M	110	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
22	255	F	115	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
23	265	M	120	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
24	275	F	125	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
25	285	M	130	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
26	295	F	135	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
27	305	M	140	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
28	315	F	145	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
29	325	M	150	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
30	335	F	155	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
31	345	M	160	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
32	355	F	165	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
33	365	M	170	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
34	375	F	175	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
35	385	M	180	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
36	395	F	185	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
37	405	M	190	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
38	415	F	195	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
39	425	M	200	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
40	435	F	205	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
41	445	M	210	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
42	455	F	215	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
43	465	M	220	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
44	475	F	225	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
45	485	M	230	Insidious	Progressive	None	Chronic active hepatitis	Chronic active hepatitis	Good
46	495								

MGQCYGKFDDGGEGEDLFRQKVQVSRTPKHGWSNSNRGSFNNGGGASPMRAKTSFG
SSHPSPRHPSASPLPHYTSSPAPSTPRRNIFKRPFPSPAKHIQSSLVKRHGAKPKEGGAIP
EAVDGEKPLDKHFGYHKNFATKYELGHEVGRGHFGHTCYAKVRKGEHKGQAVAVKIIS
KAKMTTAAIAEDVGREVKILKALTGHQNLVRFYDSCEDHLNVYIVMELCEGGELLDRILS
RGGKYSEEDAKVVVRQILSVVAFCHLQGCVVHRDLKPENFLFTTKDEYAQLKAIDFGLSD
FIKPDERLNDIVGSAYYVAPEVLHRLYSMEADVWSIGVITYILLCGSRPFWARTESGIFRA
VLRADPSFEEAPWPSISPEAKDFVKRLLNKDMRKRMTAAQALTHPWIRSNNVKIPLDILV
YRLVRNYLRASSMRKAALKALSKTLTEDETFYLRTQFMILLEPSNNGRVTFENFRQALLK
NSTEAMKESRVFEILESMDGLHFKKMDFSEFCAAISVLQLEATERWEQHARAAYDIFEK
EGNRVIYPDELAKEMGLAPNVPAQVFLDWIRQSDGRLSFTGFTKLLHGISSRAIKNLQQ*

[illegible]

MGNTSSRGSRKSTRQVNQGVGSQDTREKNDSVNPKTRQGGSVGANNYGGKPSSGAQA
GERSTSAPAALPRPKPASRSVSGVLGKPLSDIRQSYILGRELGRGQFGVTYLCTDKMTNE
AYACKSIAKRKLTSKEDIEDVKREVQIMHHLSGTPNIVVLKDVFEDKHSVHLMELCAG
GELFDRIIAKGHYSERAAADMCRVIVNVVHRCHSLGVFHRDLKPENFLLASKAEDAPLK
ATDFGLSTFFKPGDVFQDIVGSAYYVAPEVLKRSYGPEADVWSAGVIVYILLCGVPPFWA
ETEQGIFDAVLKGHIDFENDPWPKISNGAKDLVRKMLNPNVKIRLTAQQVLNHPWMKED
GDAPDVPLDNAVLTRLKNFSAANKMKKLALKVIAESLSEEEIVGLREMFKSIDTDNSGTV
TFEELKEGLLKQGSKLNESDIRKLMEAADV DGN GKIDFNEFISATMHMKNKTEKEDHLWA
AFMHFDTDNSGYITIDELQEAMEKNGMGDPETIQEIISEVDTDNDGRIDYDEFVAMMRK
GNPGAENG GTV NKPRHR

Figure 4 shows the structure of the *LB OCS3* construct. The construct is a linear DNA molecule containing several key elements: a *LB OCS3* origin of replication, a *NPTII* gene, a *Super promoter*, a *Gene of Interest*, a *NOSpA* gene, and a *RB* (Right Border) element.

FIGURE 4

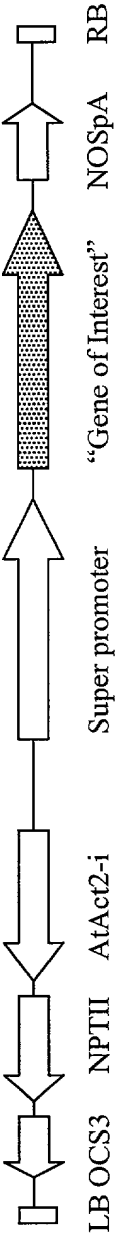
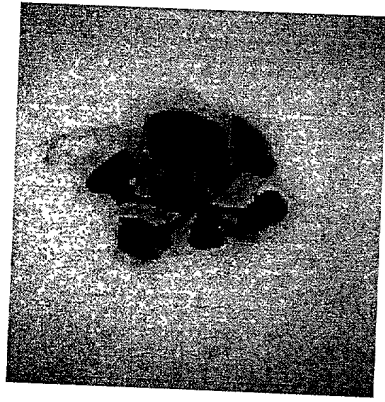
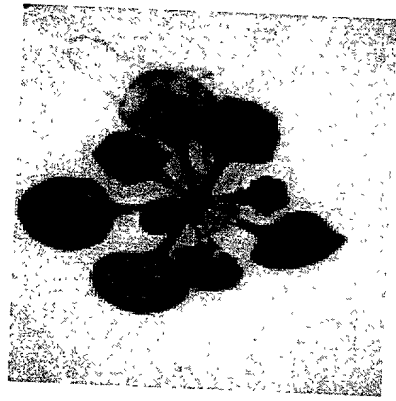
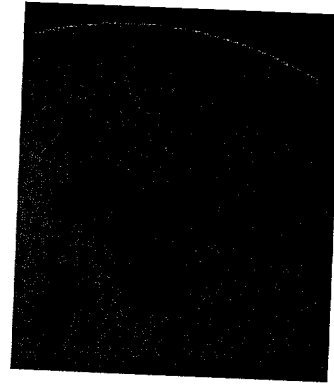
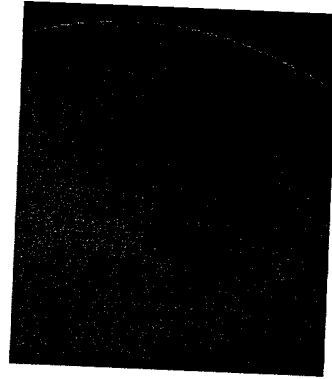
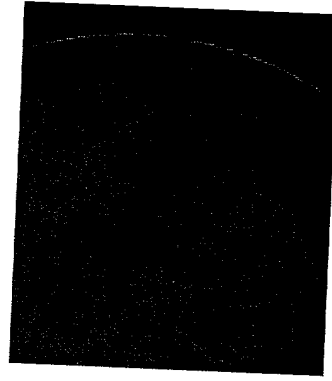


Figure 5 shows the effect of PpPK-6 on the growth of Arabidopsis thaliana under drought conditions. The plants were grown in a controlled environment and subjected to drought stress for 14 days. The control plants (right) show significant wilting and leaf death, while the PpPK-6 treated plants (left) maintain a more robust growth habit.

Figure 5

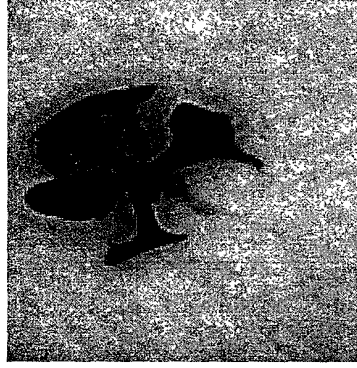
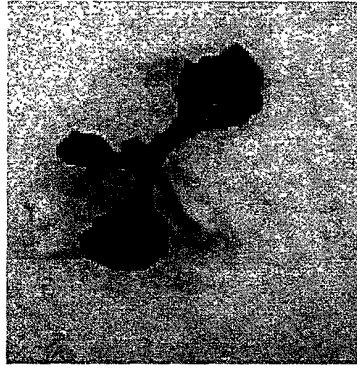


PpPK-6
Drought

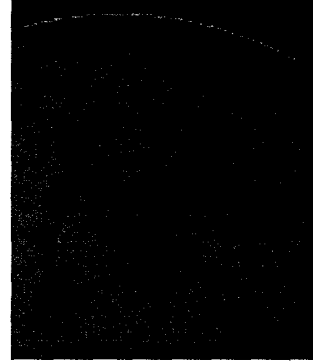
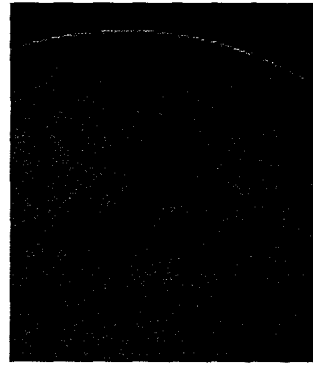


Control
Drought

Figure 6

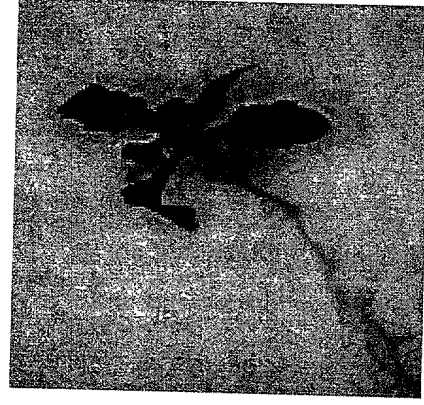


PpPK-7
Drought

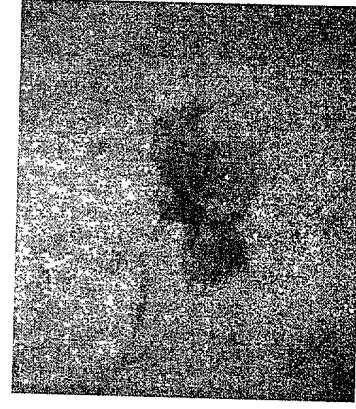


Control
Drought

Figure 7



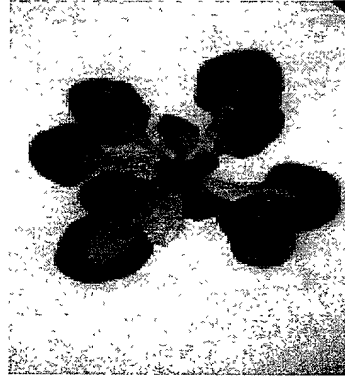
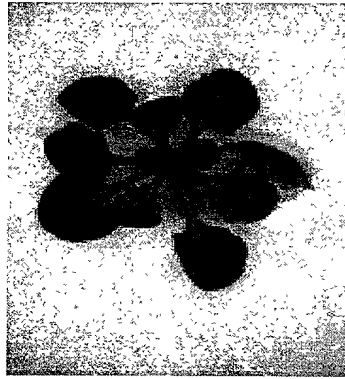
PpPK-7
Freezing



Control
Freezing

Figure 8

Figure 8



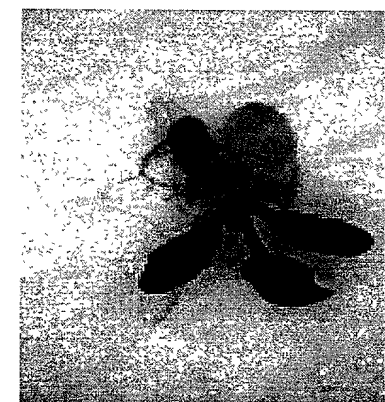
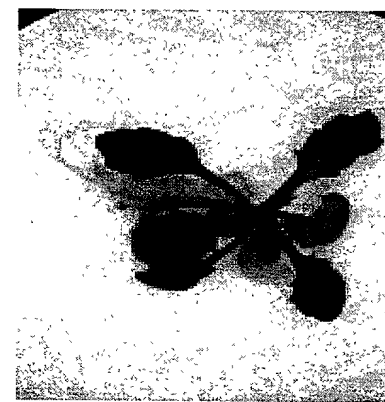
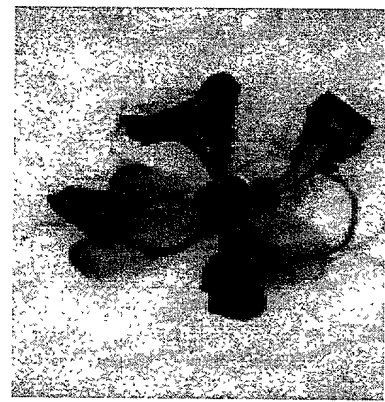
PpMPK-3
Drought



Control
Drought

Figure 9

Figure 9



PpPK-9
Freezing



Control
Freezing

Figure 10

Figure 10

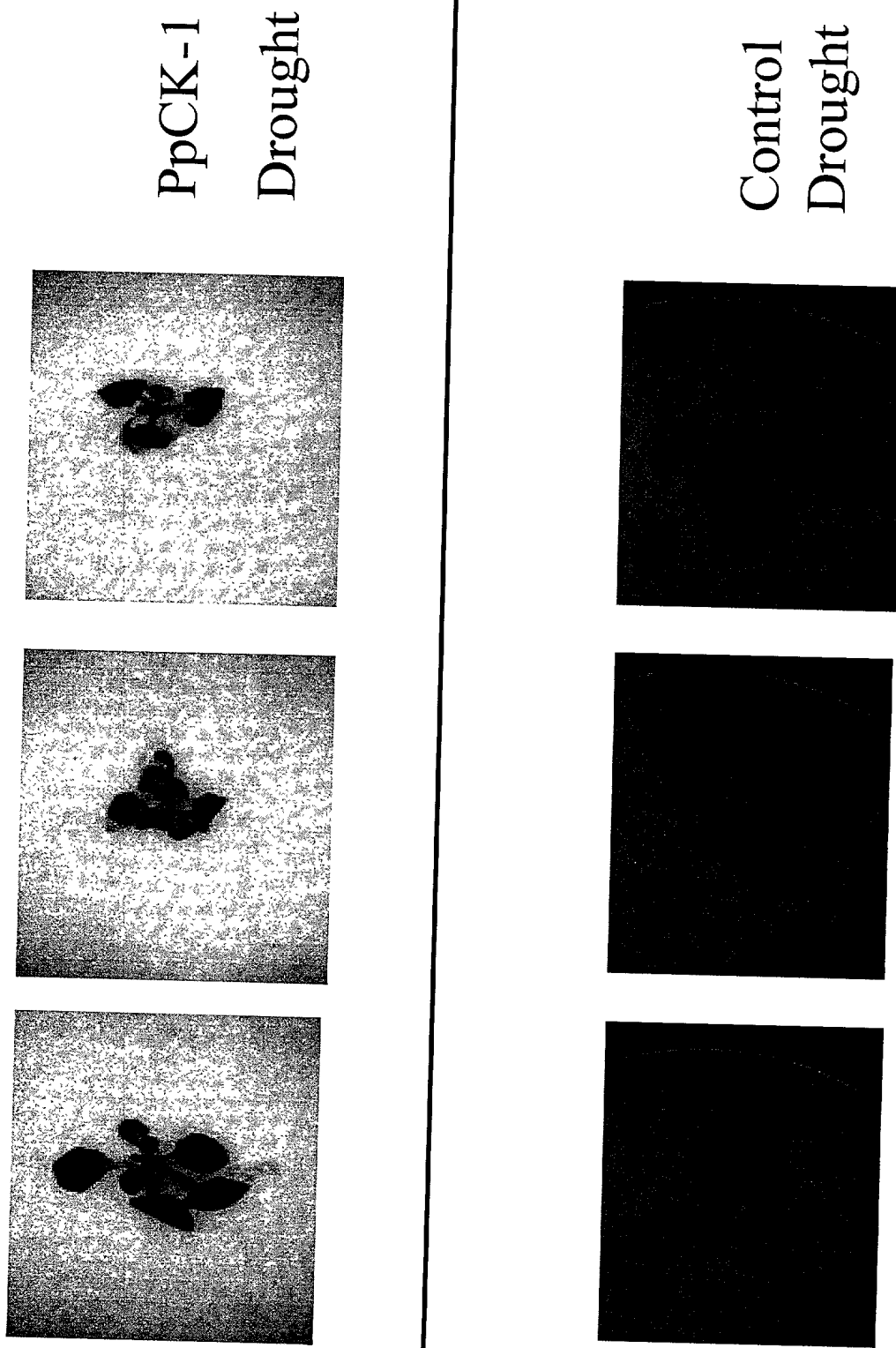
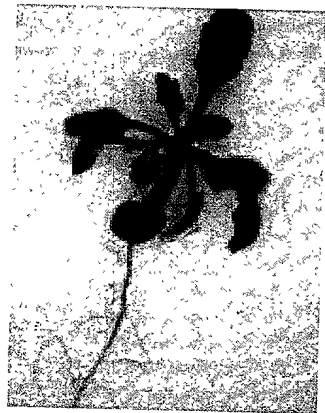
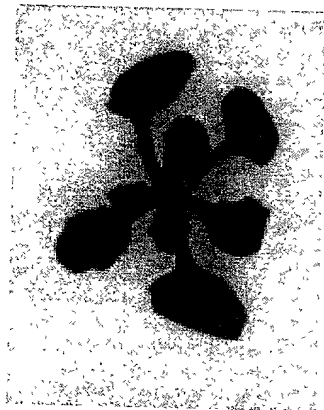
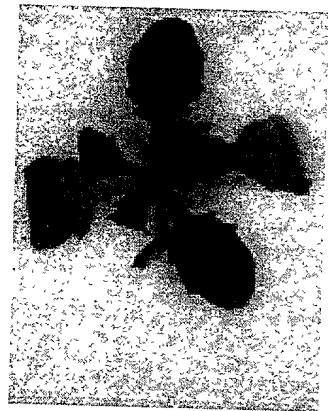
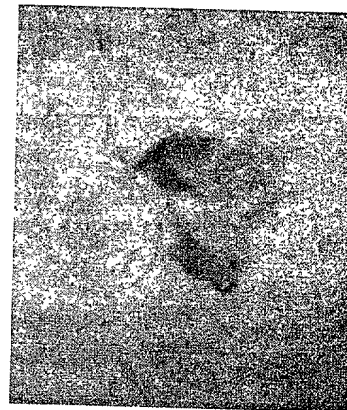


Figure 11

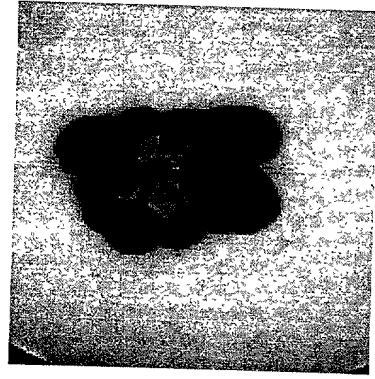
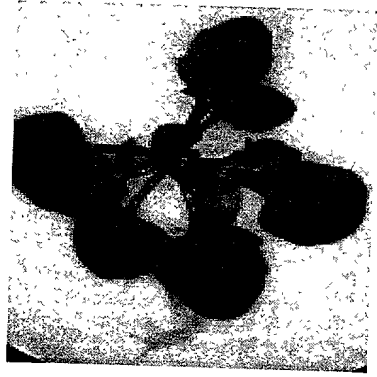


PpCK-1
Freezing

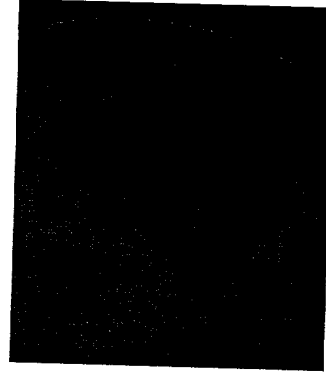
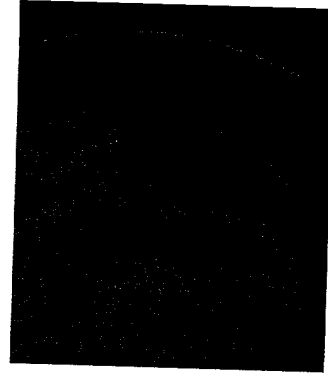


Control
Freezing

Figure 12



PpCK-2
Drought



Control
Drought

Figure 13

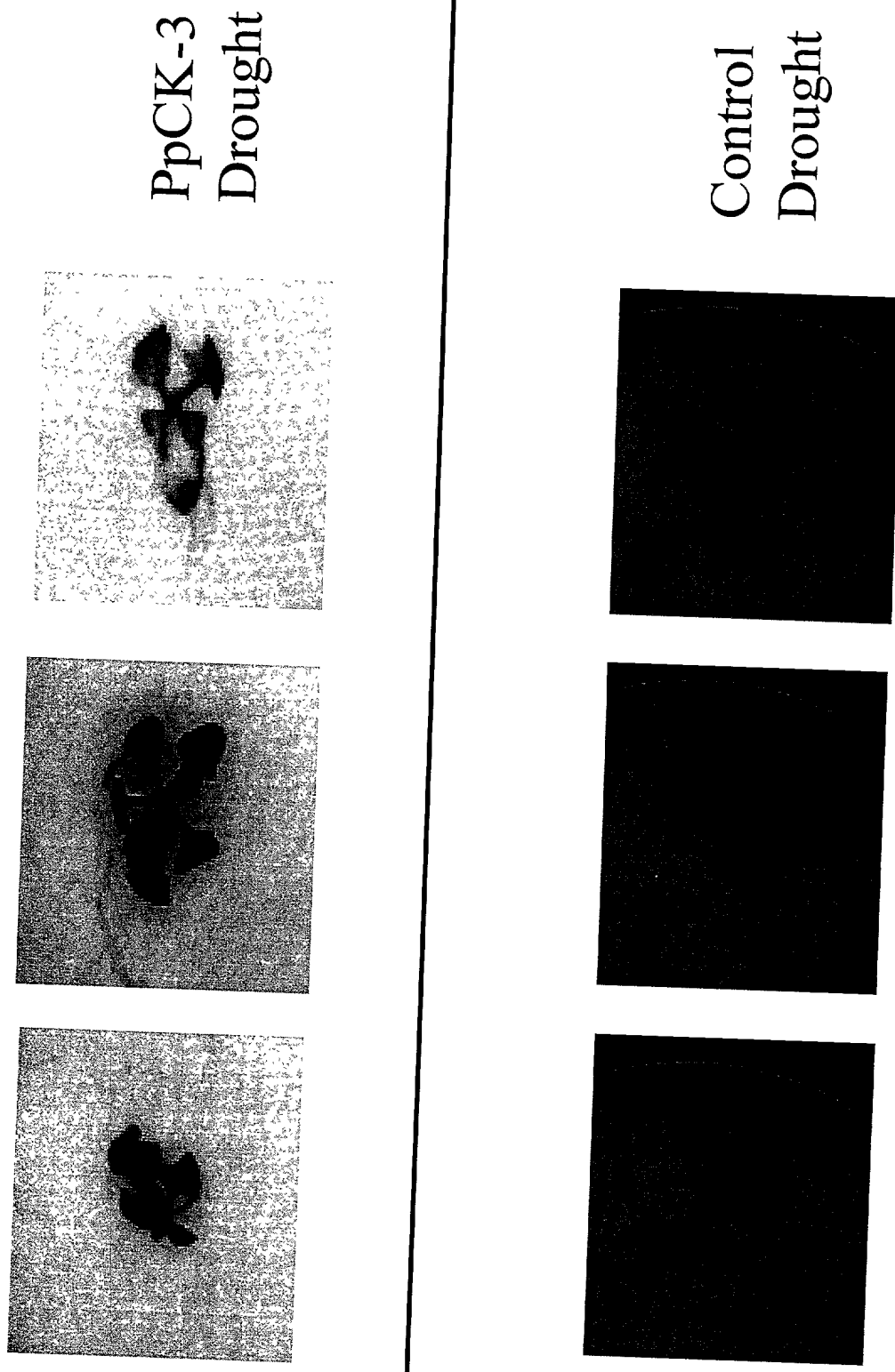
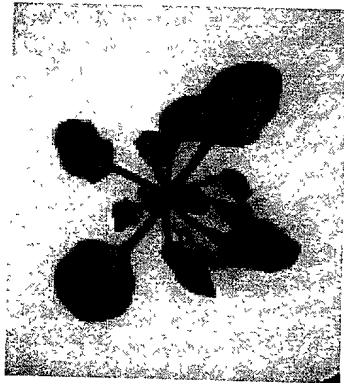
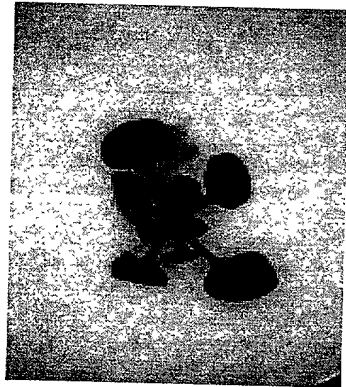
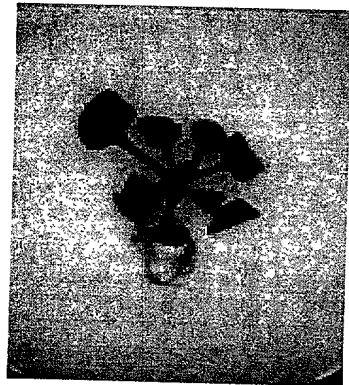
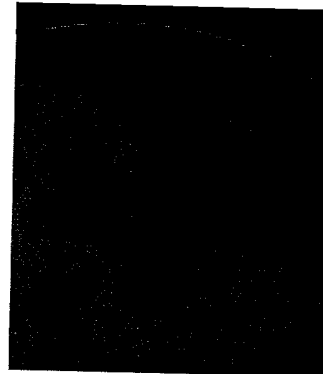
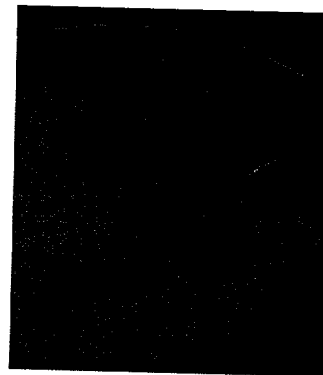
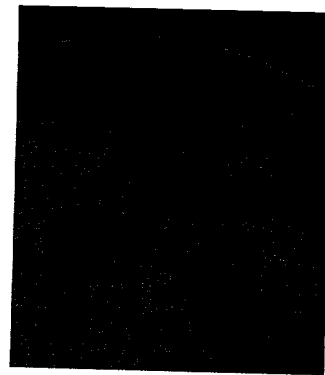


Figure 14

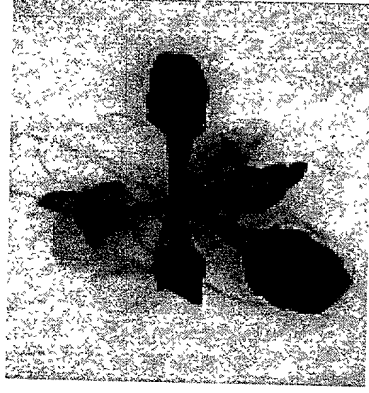
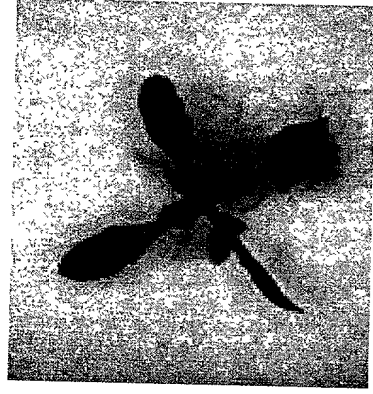


PpMPK-2
Drought

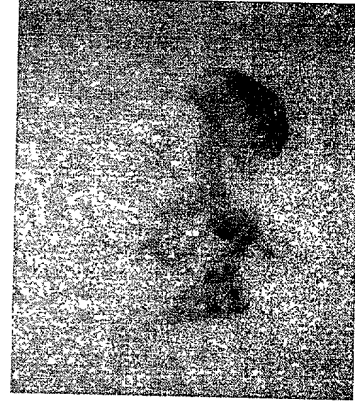


Control
Drought

Figure 15



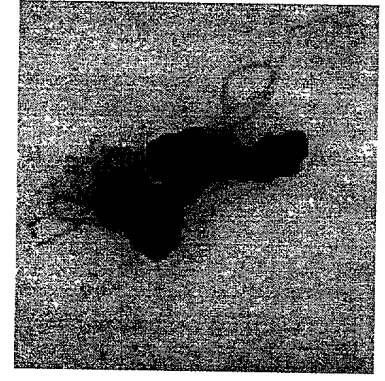
PpMPK-2
Freezing



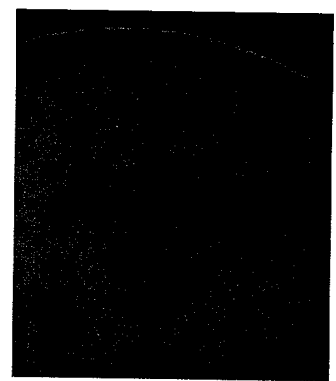
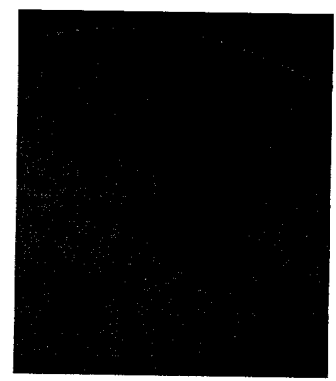
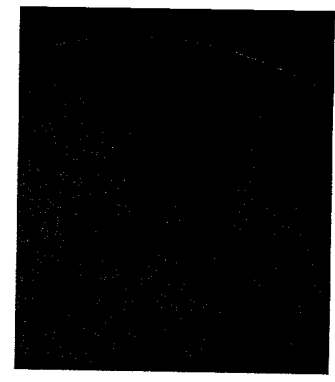
Control
Freezing

Figure 16 shows the effect of PpMPK-3 on Arabidopsis seedlings under drought stress. The top row shows control seedlings, and the bottom row shows seedlings treated with PpMPK-3. The left column shows seedlings after 2 days of drought, and the right column shows seedlings after 4 days of drought. The PpMPK-3 treated seedlings show significantly higher survival and growth compared to the control seedlings under drought stress.

Figure 16



PpMPK-3
Drought

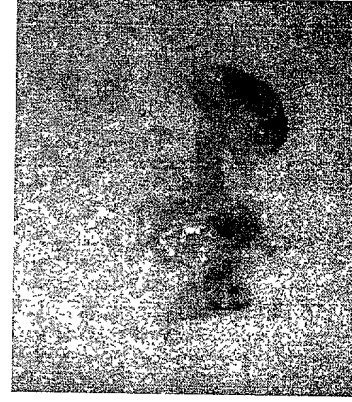


Control
Drought

Figure 17



PpMPK-3
Freezing



Control
Freezing

Figure 18 shows three panels of Arabidopsis root growth under different conditions. The top panel shows roots grown in a control medium. The middle panel shows roots grown in a medium containing PpMPK-4. The bottom panel shows roots grown in a medium containing PpMPK-4 and a drought treatment. The roots in the control medium are long and straight. The roots in the PpMPK-4 medium are shorter and more curved. The roots in the PpMPK-4 and drought medium are the shortest and most curved.

Figure 18

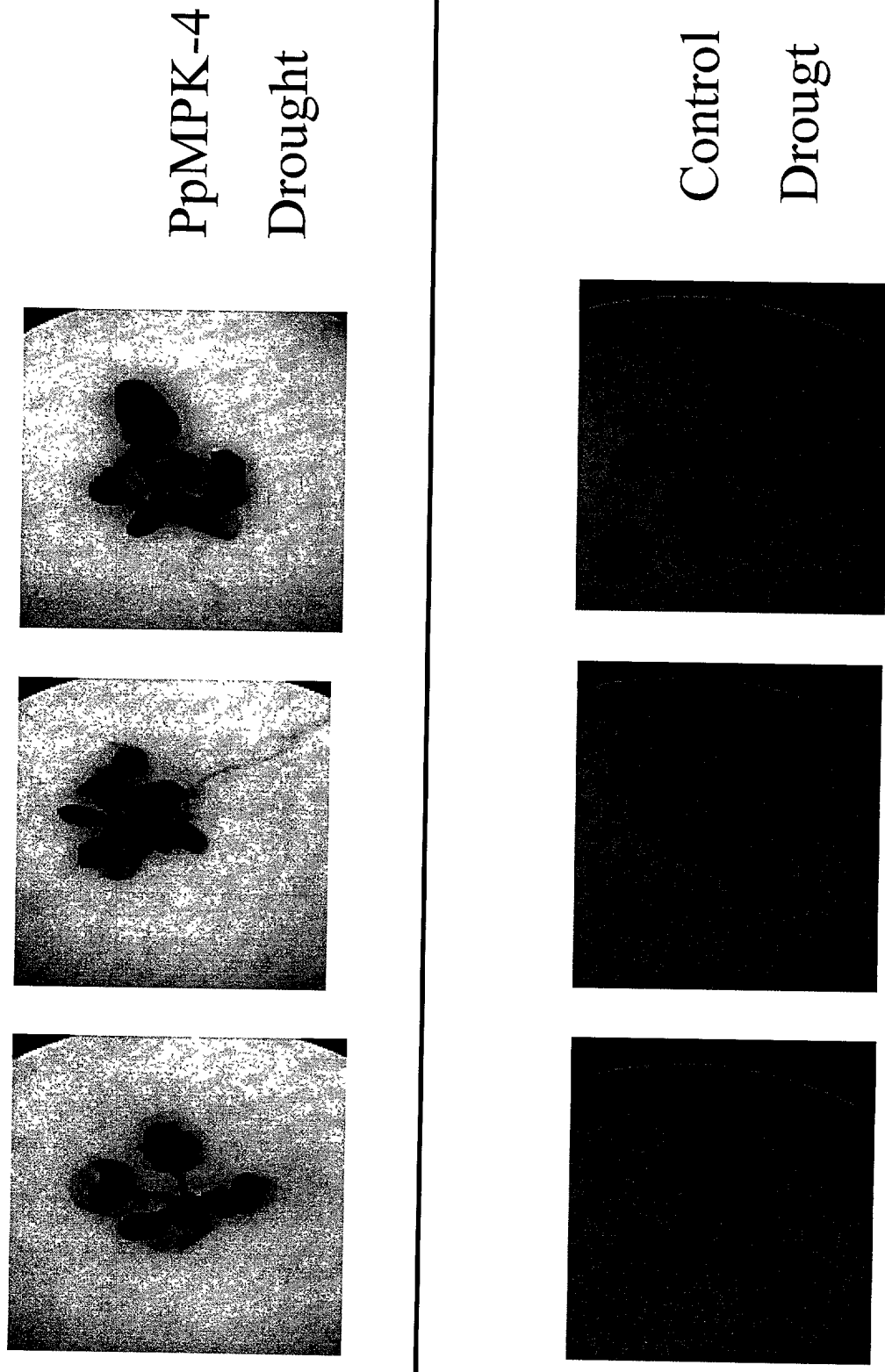
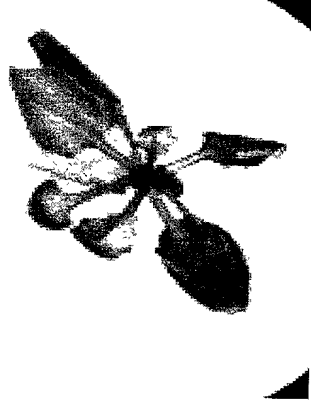
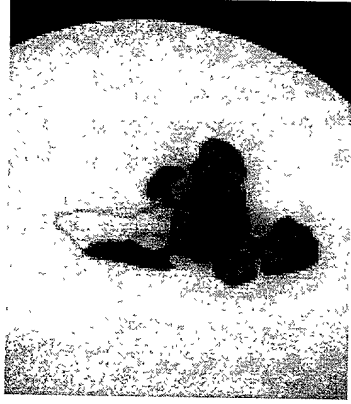
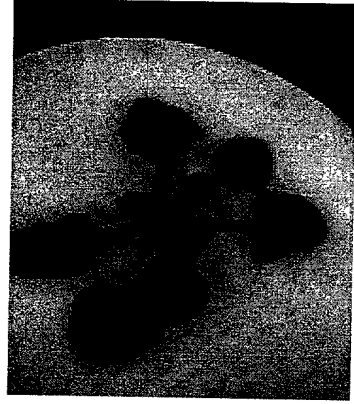
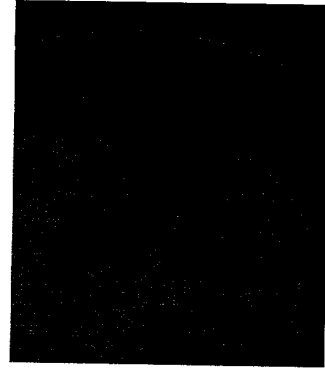


Figure 19 shows the effect of PpMPK-5 on the growth of Arabidopsis thaliana under drought conditions. The figure is divided into two main sections: 'PpMPK-5 Drought' and 'Control Drought'. Each section contains three images: a whole plant, a close-up of the root system, and a close-up of the leaf surface. The 'PpMPK-5 Drought' section shows plants that are significantly larger and have more developed root systems compared to the 'Control Drought' section, which shows much smaller, stunted plants with underdeveloped roots and wilted leaves.

Figure 19



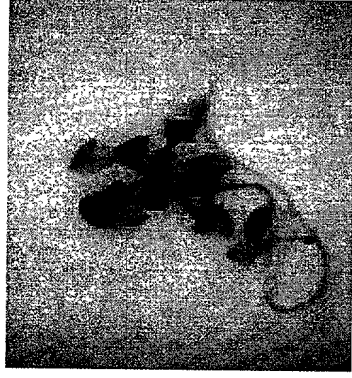
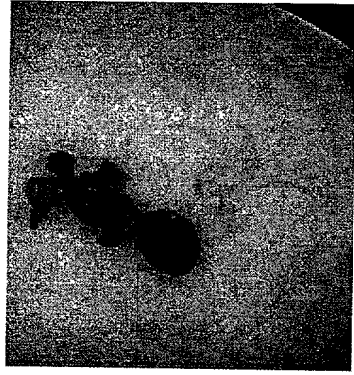
PpMPK-5
Drought



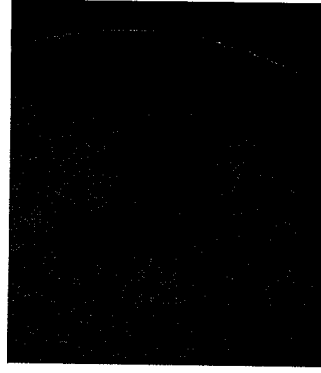
Control
Drought

Figure 20

Figure 20



PpCPK-1
Drought



Control
Drought

Figure 21 shows the effect of PpCPK-2 on the growth of Arabidopsis plants under drought conditions. The plants were grown in the presence of PpCPK-2 and then subjected to drought stress. The results show that the plants treated with PpCPK-2 exhibit a higher survival rate and faster recovery after drought stress compared to the control plants.

Figure 21

